

THE AUTOMOBILE



The Pathfinder left Buffalo, Friday, May 1, carrying Dai H. Lewis, secretary of the A. A. A. Touring Board; Leon Myron Bradley of New York; N. Lazarnick, official photographer, and Ray McNamara, driver of the car.

The run from Buffalo to Erie was through seven inches of snow and mud and a stinging wind was sweeping in from Lake Erie. The trip will take the tourist through fifty miles of the great vineyards and wine cellars of Western New York State. The first bad stretch of road was struck while going through the Indian Reservation outside of Buffalo. For twelve miles the roads were in terrible condition. Both rear chains were thrown off. The highways in dry weather should make excellent touring, and it will be through a flat, rolling country with sandy and clay roads in spots to the Hotel Rider, Cambridge Springs. The only sunshine which the Pathfinder saw in the first eight

TO the lover of Nature and he who delights in gazing at towering mountains and upon low sweeping valleys, watered by beautiful rivers and along whose banks live the thrifty Pennsylvania "Dutch" farmers, the "1908 American Automobile Association Reliability Touring Contest" for the Glidden and Hower trophies will eclipse any preceding tour in grandeur, magnificence, and exhilaration.

While it is true that last year's route took the tourists through a section of Western Pennsylvania, the route being laid out by the big six-cylinder Premier Pathfinder is far more pleasurable than that of 1907. The route as laid out for the first five days by Secretary Dai H. Lewis, of the A. A. A. Touring Board, is as follows:

- First day—Buffalo to Cambridge Springs
- Second day—Cambridge Springs to Pittsburg
- Third day—Pittsburg to Bedford Springs
- Fourth day—Bedford Springs to Harrisburg
- Fifth day—Harrisburg via Philadelphia to Milford, Pa.

Practically one-quarter of the tour has been laid out, as two thousand miles will be covered by the Gliddenites on the "Leap Year Tour."

No one but those on the Premier Pathfinder can realize what the car and the passengers have been through, unless it is those who have participated in the New York-Paris race. Time and again the car has plunged through mud, slush, and snow, many times sinking to the running board; at other times the axles have been buried in soft, clayish mud. With the exception of the Lackawanna steel works outside of Buffalo and a one-hundred mile run along Lake Erie, the trip from Buffalo to Cambridge Springs has little interest.

days was while at luncheon at the Hotel Rider. When the car was on the way, a snowstorm, which developed into a blizzard, continued during the afternoon, as far as Mercer, Pennsylvania. The thermometer registered only thirty degrees above zero. The glass front had to be lowered so that the driver could see the nature of the road ahead of him.

The worst roads of the distance already covered were encountered between Mercer and Pittsburg. From Harmony to the plank road, fourteen miles out of Pittsburg, about six miles an hour was averaged. The first cars which the Pathfinder saw between Buffalo and Pittsburg were met on the plank road, but none were seen on the country roads between Buffalo and Carlisle (famous for the Indian school) except a White, a Stanley, and a Pullman, which carried a delegation from the Harrisburg Motor Club, who came out to Carlisle to meet the Pathfinder and pilot them into the city. At the end of the plank road in Pittsburg, the Premier Pathfinder was met by E. L. Seeley, Pittsburg agent for the Premier car. The entrance of the Pathfinder into Pittsburg was a continual ovation for the mud-besmeared car.

Going from Pittsburg to Johnstown, the coal belt of Western Pennsylvania is traversed. At Export and Salemville, the coal and coke regions of H. C. Frick are passed. Here the burning coke ovens with their flames leaping scores of feet into the air can be witnessed by the tourists.

This year's run from Pittsburg west will take the tourists into Johnstown by the way of Alexandria, Blairsville, and Cramer. Eight miles west of Johnstown, the Cramer pike is struck, being the first stretch of macadam road which was seen between there and Buffalo. The road is along the Conemaugh



Encountering a May Snowstorm at Mercer, Pa.



"The Sheep Upon a Thousand Hills" Preceding Us.

river and through Laurel Hill Gap and Pack Saddle Gorge. It was down this river and through the gap and gorge that three thousand victims of the Johnstown flood were swept to eternity. The scenery through this territory is one of grandeur and admiration. It is in this section that the most picturesque route of the Pennsylvania railroad is situated. The famous stone bridge in Johnstown, which caused the great flood, will be passed



Secretary Lewis Deliberating.

by the Gliddens. It was there that the wreckage piled up and caused the water to back up into the city. The road goes by the Cambria Steel Works, the largest steel concern in the world, which employs twenty-two thousand hands. Johnstown is the pioneer town in the iron industry, its first plant being operated in 1560.

The Johnstown Automobile Club is instrumental in having the tour pass through that section of the country. Their representative told Mr. Lewis that they would do all in their power to have the roads in the best of condition, and will post all bad and dangerous turns in the vicinity of Johnstown. The club sent a representative to Pittsburg to pilot the Pathfinder into Johnstown, and this representative continued with the party several miles out of Johnstown on the road to Bedford Springs. The scenery in the vicinity of Johnstown is excellent. Great towering peaks are on

one side of the highway, and in many places one can look down several hundred feet on the Conemaugh river.

The roads from Johnstown to Harrisburg are sandy and of red clay. The road from Johnstown to Bedford Springs is by Winber, Pleasantville, and over the Allegheny mountain. This is a more northern road than was taken last year. The Allegheny mountain is the highest peak of the Allegheny range and is struck about twelve miles west of Johnstown. The top of the mountain is a wild, barren waste of land, the timber having been cut off. The road over which the tourists will pass is the original roadbed of the timber railroad. The mountain is infested with black bear, wildcats, mountain sheep, and other wild animals. For five miles the Pathfinder drove through clouds so thick that the acetylene lamps had to be lighted. An altitude of 2325.6 feet was reached. On coming down the mountain, extreme carefulness will have to be exercised by the drivers in the contesting cars, as a skid of three or four feet would mean the hurling of the automobile to a deep ravine, something like one thousand feet below. The roads are very rocky with many dangerous curves. From the foot of the mountain to Bedford Springs, clay predominates. If the tourists have to drive over this road after two or three days' rain, the going will be hard and many cars are likely to be put out of the running.

The first real good roads and the first opportunity at speeding since the Pathfinder left Buffalo was on the macadam road from Bedford Springs to Harrisburg. The tourists will be taken from Bedford Springs over the same route as last year, as far as McConnellsburg. From Breezwood to McConnellsburg, a distance of seventeen miles, it is one long steady climb and coasting. The course is filled with many road breakers, which Dai Lewis has jokingly termed "marcelle waves." To the automobilist, these car breakers will prove to be terrors and extreme care will have to be used. From Breezwood to McConnellsburg



Thumping Over the Plank Road into Pittsburg.



In Front of Soldiers' Monument at Blairville, Pa.

the Pathfinder coasted for a distance of three miles, the throttle never being disturbed in covering the entire stretch down hill.

Going west from McConnellsburg to Harrisburg, the road is through Chambersburg, one of the most beautiful towns in Pennsylvania. In 1864 the town was destroyed by Confederate cavalry. The road is very excellent; the highways are lined with massive maples and large old residences, surrounded by spacious lawns. The country is flat and rolling to Harrisburg. The roads are in excellent shape and the tourists can cut out a rate of fifty or sixty miles an hour without police interference. On each side of the highway are beautiful farms with fertile soil. Wilson College for girls is passed, and from there on level hard roads lead into Carlisle, past the Carlisle College, made famous by the Carlisle Indian football team.

Between Pittsburg and Harrisburg, no "speed limit" signs were seen. The only drawback to this course is the great number of tollgates through which the tourist must pass.

The fifth day's tour from Harrisburg to Milford will take the cars through Lebanon, Reading, Allentown, Bethlehem, and Easton, along the Delaware river, through the Delaware Water Gap and over the Blue Ridge mountains. The highways through Lebanon, Reading, and Allentown cannot be surpassed. Nowhere in the country, not even the famous New England State highways can surpass those over which the Glidden tourists will pass. After passing Allentown, soft clayish mud was struck, which made the going very slow for the Pathfinder. Time and again through this district, the car again sank to its running board and axles. One automobile was passed outside of Easton, being hauled through the mud by a pair of mules.

The sixth day's run from Milford will probably terminate at Albany, New York, although this has not been definitely decided upon by Secretary Lewis. Just where the route will go from Albany is uncertain, but it is safe to say that the finish will either be at Saratoga Springs or Buffalo. New England will be visited quite extensively.

PHILADELPHIA IN TOUR; NEW JERSEY AVOIDED

The route of the A. A. A. tour was changed on Monday last so as to include Philadelphia and still avoid New Jersey. Secretary Dai Lewis had reached the Delaware Water Gap, but Chairman F. B. Hower directed that he go back to Harrisburg and lay the route from there to Philadelphia.

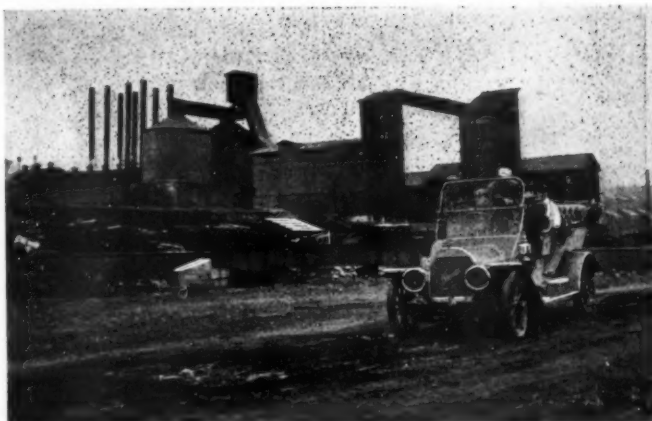
The reason for eliminating New Jersey from the route of this year's tour is the motor law of the State. It was originally planned to run from Philadelphia to Atlantic City and spend Sunday at that resort. It would have cost the contestants about \$13 license fee for each car, however, for the two days, and so the State was avoided, and, instead of getting a reasonable fee, like other States, it will get nothing. Its principal resort will likewise be minus several thousand dollars that the tourists would have spent there but for the attitude of the State's lawmakers toward those who use automobiles.

CINCINNATI CLUB IS SIGN-BOARDING ROADS.

CINCINNATI, O., May 11.—The Automobile Club of Cincinnati is busying itself with numerous activities at this season of the year, not the least important of which is the marking of the roads throughout the entire county. The opening of the new clubrooms in the Gibson House, which took place a few weeks ago, proved a veritable magnet, and the membership of the club has been increased by fully 100 recruits, Dr. C. L. Bonifield, the president, stating that the club has never been in such a flourishing condition before. The runs and tours committee is at present working on a hill-climb to be held May 23, and is also laying plans for an orphans' day in June.

AUTO ENTITLED TO HALF THE ROAD.

ERIE, PA., May 11.—It is not often that statutes dating back as far as 1820 have to be invoked in the trial of a case involving



Among the Coke Ovens at Portersville, Pa.



Where the Road Leads Into the Town of Cramer.



Along the Conemaugh River Near Johnstown, Pa.



Road Makers Preparing the Way at Johnstown.



Mountainous Road Near Carlisle.

employed a few miles out of the city. He was driving west on the Lake road, a little east of the Six-Mile schoolhouse, recently, when H. N. Fleming came up behind in a car. Repeated signals failed to have any effect, and when the driver finally man-



Where the Lowing Herd Was Encountered Between Windber and Bedford.

an autoist's rights on the road, but that is what was done at the instance of the Erie Motor Club's attorney in the prosecution of Herbert Hower, a farm hand, em-

ployed a few miles out of the city. He was driving west on the Lake road, a little east of the Six-Mile schoolhouse, recently, when H. N. Fleming came up behind in a car. Repeated signals failed to have any effect, and when the driver finally man-

FERRY TO BENEFIT SOUTHERN TOURISTS.

PERRYVILLE, Md., May 11.—Now that a ferry is plying regularly between this place and Havre de Grace, tourists coming this way will no longer be subjected to the inconvenience of having to load their machines on a flat car and have them hauled across the railroad bridge. The first boat in the morning leaves here at 6:15 A.M. and the other side at 6:30, the schedule thereafter being half hourly until 8:45 P.M., the boats being run an hour later on Saturday, while the Sunday hours are from 8 A.M.

FACTS ABOUT THE A. A. A. BUFFALO CONVENTION

BUFFALO, May 11.—Preceding the start of the annual A. A. A. tour from Buffalo, the national association will hold its first "Legislative and Good Roads Convention," in the preparation of which splendid progress is being made. Briefly outlined, this is the program that has been mapped out:

Monday, July 6.—Arrival, reception, and registration of delegates at the Iroquois Hotel, and special side trips to Niagara Falls, which is only 20 miles from Buffalo.

Tuesday, July 7.—Address of welcome by Mayor J. N.

Adam, with a morning session devoted to a discussion of "Uniform Automobile Legislation," under the direction of Chairman Charles Thaddeus Terry and members of the A. A. A. Legislative Board.

In the afternoon the subject of "Good Roads" will receive attention under the supervision of Chairman Robert P. Hooper and members of the Good Roads Board. State Highway Commissioners Hunter, of Pennsylvania; McClintock, of Massachusetts, and Skene, of New York, will be included among the speakers. In the evening the delegates will be entertained at a vaudeville performance at Shea's Theater.

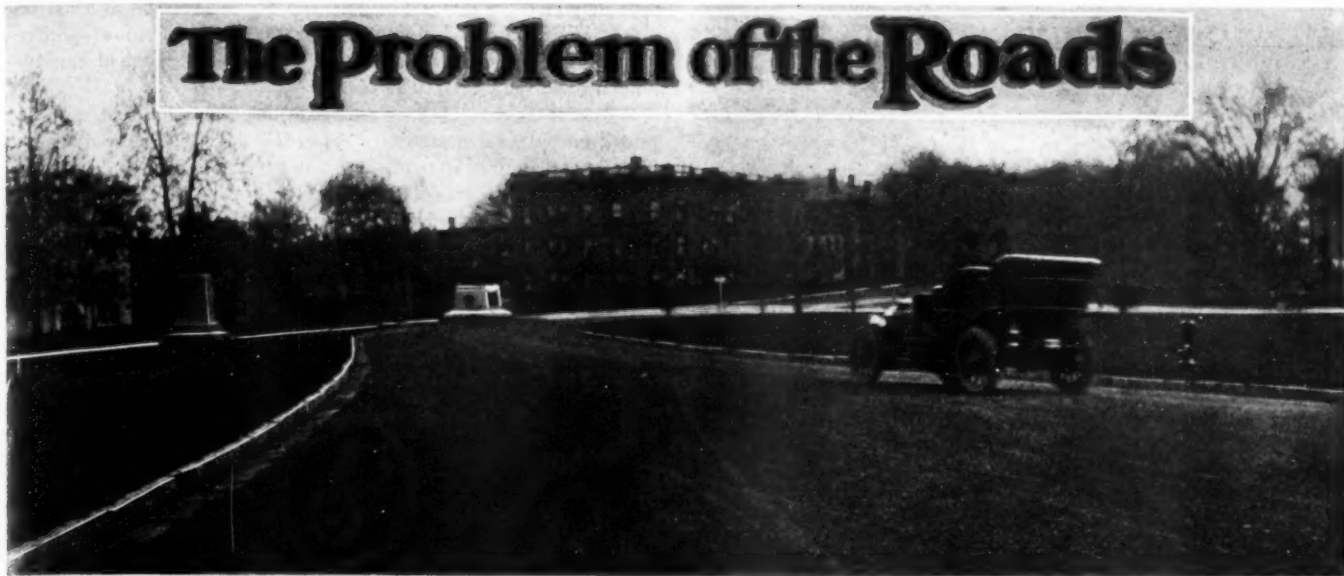
Wednesday, July 8.—"Good Roads" will be further considered at the morning session, and early in the afternoon the delegates will be given a tour of inspection over new roads under construction in and about the city. County Engineer George C. Diehl, of Buffalo, is the chairman of the Committee on Practical Roads Construction. Demonstrations will be included by road builders on the maintenance and preservation of the highways, illustrating various methods for making roads dustless.

In the evening will come the banquet at the Iroquois Hotel, with President William H. Hotchkiss presiding. It is expected that Governor Hughes, of New York; Governor Stuart, of Pennsylvania, and Governor Harris, of Ohio, will be among the speakers.

Thursday, July 9.—Start of the Fifth Annual Reliability Touring Contest of the A. A. A., including the contests for the Charles J. Glidden trophy for touring cars and the Frank B. Hower trophy for runabouts, which will lead the tourists through 2,600 miles of picturesque country.



An Archaic Toll Gate Just Before Entering Harrisburg.



Coal Tar Treated Roadway South of the State Capitol at Hartford, and Leading Out of the Capitol Grounds.

HARTFORD, CONN., May 11.—In the matter of improved highways, Connecticut has won an enviable position, and this is due in a great measure to the tireless efforts of State Highway Commissioner James H. Macdonald. It is the sole ambition of this official that before he shall have terminated his office and relinquished the reins to his subordinates that the State will be dotted everywhere with faultless highways. At the present time the roads of the State are, for the most part, very good, and the commissioner is ever active in an endeavor to eliminate the bad spots. But, like all other sections of the universe, Connecticut has the dust evil to overcome, and how to obliterate the nuisance is a phase of the situation to which the commissioner has given much thought and consideration. Last summer, for instance, crude oil or asphaltum was tried, and the results were quite satisfactory. Yet, anything that savors of improvement receives due consideration.

The commissioner is of the opinion that coal tar is about as efficient a road preservative and dust layer as there is to be had at this time. Some time ago the beautiful macadam drives which surround the State capitol at Hartford were treated to two coats of coal tar. Needless to say, these tar stretches have worn very well and resisted automobile traffic. The commissioner firmly believes that automobiles must necessarily have a deleterious effect on the highway, for he drives a car himself, and, likewise, is aware that dust is an evil to be banished.

When a representative of THE AUTOMOBILE called on Mr. Macdonald and asked him what he thought of tar roads, he took the inquirer to his office window, overlooking the roads, and remarked: "There they are; you know when they were laid. How do they look?" But the mere fact that someone was in quest of road knowledge rendered the commissioner all action, for he will resort to all sorts of methods to make one fully comprehend. He described the processes necessary for the construction of a tar road according to the specifications of the highway commission.

For instance, the tar may be applied only on a very hot day, and only after the dew is off the ground. First of all, the contractor who undertakes the work must pare down and shape all gutters in conformity with the original cross-section of the road. All cleanings and scrapings must be removed well to one side of the road to be treated. After the shoulders or gutters have been formed and shaped, all dirt or accumulations must be cleaned off, and for this purpose split rattan brooms must be used. The process of scraping and cleaning is carried on until the No. 2 stone is entirely exposed, and clean and free from all foreign material, so that there shall be no interruption between No. 2 stone and the primary coat of coal tar. Any toe marks,

ruts or depressions that may exist must be thoroughly swept out, and must be filled in with stone previously coated with coal tar. The coal tar used to saturate the road surface must, according to the State specifications, have about 15 per cent. of pitch melted into it, so that the pitch will become liquified and thoroughly mix with the tar. The stone used for repairs must not exceed one inch longest diameter, and shall be placed in such depressions as may be, and thoroughly rolled into the original fractures. Before the stone is applied to fill ruts and the like, the depressions must be slush treated to a coat of coal tar. After the road has been cleaned thoroughly, and all fractures repaired, the primary coat of tar is applied to the travel path.

The tar used must have been heated to 225 degrees Fahrenheit before application. After the tar has been flodded on the road, it must be broomed in thoroughly with heavy split rattan brooms. When the road surface has sufficiently absorbed the initial coat of tar, a second application is made. This must also be heated to 225 degrees Fahrenheit, applied in the same manner, and thoroughly broomed in, so that all interstices and voids



Making Turn at 25 Miles per Hour, Without Dust.



Tar Road on North Side of Capitol at Hartford.

The smooth, even surface is very noticeable. Automobile traffic is very heavy at this point, as this road is used as a short cut in circling the Capitol grounds.

will be completely filled. Following closely on this second application of tar is a treatment of chips, or, more properly speaking, of splinters of clean trap rock not exceeding 3-4 of an inch longest diameter. This layer of fine stone or splinters must be

applied while the tar is hot, and the depth must be at least one inch. Immediately after the application of the stone splinters, the entire surface is rolled down to thoroughly imbed the covering in the second coat of tar.

No water-gas tar may be used, nothing but pure coal tar being permitted by the commission. As previously stated, the day when the tar application is made must be dry and hot, and the road must likewise be very dry. No tar is permitted to be applied when indications point to a storm, or in the event of a storm, until twenty-four hours thereafter. The barrels containing the tar, before the tar is put in the kettles, must be laid on the sides, bung up, for not less than five hours, so that all water contained in the tar will come to the surface, and this must be removed before the tar is placed in the kettles. Only new and fresh stones and splinters can be used. A ten-ton steam roller is used to roll down the surface after the splinters have been applied.

It will be noted that the foregoing specifications are somewhat rigid, and roads constructed in conformance therewith should render the maximum of service. According to Commissioner Macdonald, the tar roads that surround the State capitol are absolutely waterproof at all seasons. These roads are perhaps more extensively used by automobiles than by horse vehicles, and just how well they wear is shown by the accompanying photographs. Every dealer in town who has a machine out for demonstrating purposes includes in the itinerary a run over these roads. Thus it will be seen they are much traveled. They are free from dust and present a smooth, hard surface. The commissioner contemplates treating other roads throughout the State with tar during the coming season.

AN EXPLANATION OF WHAT COAL TAR IS MADE FROM

SO much interest has been aroused by the successful experiments in road preservation and dust-laying with the aid of coal tar that many would like to know what coal tar is, and just how it is produced. A little inquiry is sufficient to show that the average man has not the faintest conception of what this product is, so that the following information, gleaned from a recent report of the Bureau of Forestry, is timely.



Macadam Road Leading Northward from the Capitol.

This road is not tar treated, and the difference between the road shown above and this one is very noticeable, when comparisons of surface are made.

Coal tar is composed partly of the substance known as carbon, and partly of compounds of this carbon with the gas hydrogen, and which are known as hydro-carbons. When the coal tar is heated sufficiently, away from the air, the hydro-carbons are driven off in the shape of a gas. Illuminating gas is made by subjecting coal tar of the proper kind to this process, which is known as "dry distillation." The coal is put into a long, fire-clay oven, or retort, shaped much like a giant model of the cake commonly known as "lady fingers," the retorts being about 13 feet long, 2 feet wide and 16 feet deep. A number of these retorts are built side by side, in three rows, one above the other, the ends being supported on a brick wall, which also extends around the ends of the rows and over the top.

Fire, from furnaces below, is carried by flues into this enclosure, so that the retorts are entirely enveloped in flame, and can be heated to a very high temperature. The retorts are partly filled with coal and then sealed to exclude the air. They are then heated to a temperature of about 2,100° Fahrenheit. Under this intense heat, almost all the hydro-carbons pass off, leaving behind only the "fixed" carbon, in the shape of coke. As the gas comes from the retorts, it is a thick, yellowish green smoke, and must be passed through a series of costly machines before it can be used. Many of the compounds distilled will remain in the form of gas when cooled to ordinary temperatures when the original gas is cleansed from its impurities. In the condensers, which cool the gas, the heavier compounds are left behind in the shape of thick liquids.

The heavy, strong-smelling black liquid left behind by the first cooling is what is commonly known as coal tar. This is an exceedingly complex mixture of substances, from which are obtained costly perfumes, dyes, medicines and a host of other things, including flavoring extracts. Coal tar is also produced by what is known as the by-product coke oven, used for the production of coke for steel making. In recent years, gas has been made very largely by another process which produces what is known as "water-gas." This process also produces tar that is very similar to coal tar and difficult to tell from it.

EXPERIMENTS OF THE OFFICE OF PUBLIC ROADS

WASHINGTON, D. C., May 11.—The subject of dust prevention, owing to its relation to road preservation, is of vital importance to the road builder. The Office of Public Roads carried on a series of experiments during the summer of 1907, with a view to determining, if possible, the relative value of various dust-laying preparations and crude products, and their adaptability to different conditions. The project embraced many details, and, owing to lack of funds and the difficulty in finding one road suitable for all kinds of experiments, had to be somewhat modified in the final plans and the work divided among three localities.

It was learned that the highway commission of Massachusetts intended to treat a stretch of road leading into Boston with tar preparation, and arrangements were made by which the Office of Public Roads could carry on a number of experiments on sections of this road. The road selected for the experiment was a mixed trap, and granite macadam in the township of

ture, and contained a good pitch base. The special coal-tar product was supplied free of charge by the manufacturing company in fifty-gallon barrels. It contained no water, was free from the extremely volatile oils present in the crude tar, and held a good pitch base.

The tar was applied during the month of August, and only in dry, warm weather. The method, in general, was as follows: All loose materials, dust and detritus were first removed by repeated trips of the sweeper, just before the application of the tar. Hot or cold tar, according to the experiment, was then spread upon the clean, dry road through a hose connected to the kettle, or tank wagon, as the case might be. Laborers followed the kettle, spreading and working the tar into the road surface with stiff, long-handled brooms. As the road could not be closed to traffic, it was found necessary to throw on a light covering of gravel or screenings almost immediately, in order to prevent passing automobiles from picking up the tar, although



Experimental Stretch of Coal Tar Treated Road at Savannah, Ga., on Henry Street, Looking Westward into the Suburbs.

Weston and Wayland, which had been built about ten years previously, and had but few repairs since that time. It is part of the main thoroughfare connecting New York with Boston, and is located about sixteen miles from the center of the latter city.

The automobile traffic is, for this reason, heavy, and this, in addition to teaming and other traffic, had produced serious results. In some cases, the macadam was completely broken through. There were many rut holes, some of them thirty feet long, and averaging from one to three feet in width, and a large number of smaller holes more clearly circular in shape. Over almost the whole road surface numerous small depressions or worn places were visible, and practically all of the fine material was being removed by traffic as fast as it was formed. The No. 1, or large stones, protruded above the surface, and in many cases were scattered loose, making the road extremely rough.

Sections of this road as nearly alike as possible were selected for the experiments, which were made with water-gas tar, crude coal tar, various mixtures of the two applied in different ways, and a special coal tar product.

The water-gas tar was obtained from a local gas company at \$1.50 per barrel of fifty gallons, delivered. It was a thin, oily liquid. The crude coal tar was also obtained from a local gas company in fifty-gallon barrels, at \$2 per barrel, delivered at Wayland. It had been produced at a comparatively low tempera-

ture, and contained a good pitch base. The special coal-tar product was supplied free of charge by the manufacturing company in fifty-gallon barrels. It contained no water, was free from the extremely volatile oils present in the crude tar, and held a good pitch base. The tar was applied during the month of August, and only in dry, warm weather. The method, in general, was as follows: All loose materials, dust and detritus were first removed by repeated trips of the sweeper, just before the application of the tar. Hot or cold tar, according to the experiment, was then spread upon the clean, dry road through a hose connected to the kettle, or tank wagon, as the case might be. Laborers followed the kettle, spreading and working the tar into the road surface with stiff, long-handled brooms. As the road could not be closed to traffic, it was found necessary to throw on a light covering of gravel or screenings almost immediately, in order to prevent passing automobiles from picking up the tar, although

it would have been much more satisfactory and productive of better results could the tar have been allowed to dry for a number of hours before applying the surface dressing. Finally, enough of the covering material was added to take up the excess tar and produce an even surface, and the whole well rolled with a twelve-ton steam roller until firm and smooth.

When gravel was used, it was obtained from pits located near the road, and cost the highway commission about \$1.08 per cubic yard, during the time covered by the work of the office. One-half inch clean trap screenings or pea stone, however, was used whenever it could be obtained, and was furnished at \$1.10 per ton by a rock-crushing plant located about four miles from the nearest section of the work.

Thirteen different experiments were made, four with water-gas tar alone, three with coal tar, three with mixtures of water-gas tar and coal tar, and three with special tar preparations.

Nearly all of the sections were in good condition when they were inspected in November. It is impossible at the present time to make decided comparison of the value of the different surfacings, but, undoubtedly, after the cold rains and the frosts of winter, conclusions may be reached as to the worth of each one, for these agencies are the worst enemies of work of this kind. Some facts of interest have already been noted which it may be well to mention at this time.

It has been shown that water-gas tar is a satisfactory dust layer and preventive when used in moderate quantities on



Another View of Henry Street, Savannah, Looking Cityward.

roads already in fairly good condition. It can undoubtedly be applied to the best advantage by means of an ordinary sprinkling cart on the unprepared road, and when used in this way serves to make the road surface firm and keep down the dust for some time at a very reasonable cost. Its odor is objectionable, but soon disappears. It must necessarily be applied more frequently than the heavier tars, owing to its lack of body. Where extensive repairs have to be made before, it has but little value as a binder for the large, loose material, and whether its use even in large quantities will be satisfactory for this purpose and for holding down a heavy surface dressing is a matter for the future to decide.

At the present time some of the experiments with crude coal tar show up favorably in comparison with the work with special preparations, but time is needed to decide definitely upon their relative merits. As regards application, the special preparation has the advantage over crude coal tar in being less inflammable and less likely to boil over the sides of the kettle if heated too high, but, on the other hand, its cost is considerably greater.

Two criticisms which have already been offered by farmers to both of these products are that the traction of heavily loaded wagons is increased, and that in frosty weather the road is made very slippery and offers but little foothold to horses. While the mixtures of water-gas tar and coal tar, with a light dressing of trap screenings give better results in these respects, it is impossible at the present time to say that their use will prove as satisfactory or economical in the long run. A material which can be applied cold is much easier to handle than one requiring heat, but, of course, the latter has the advantage of containing more binding material or base. Where surface dressing is needed the use of clean one-half inch screenings is certainly to be preferred to gravel, as less rolling is required and a better wearing surface is produced.

The surface treatment of roads with tar is more a palliative than a preventive of the dust nuisance. Some more permanent treatment of the road is essential for lasting results. It is the intention of the Office in the near future to carry on experiments along the latter line, with the use of a well-tarred sand to supply a part of the binding material and to fill the voids. One of the most promising methods with respect to cost which has suggested itself is to apply a layer of this tarred sand to the bottom course of No. 1 stones, which should first be well rolled. The second course of No. 2 stones should then be applied, and the whole rolled until the sand has been thoroughly worked into both the upper and lower courses. A surface application of tar should then be put on and sufficient sand or fine stone chips spread to bring the surface to a smooth and uniform condition when rolled, so that the whole structure will be firmly bound and proof against the usual rapid disintegration.

SAVANNAH'S ROAD TARRING EXPERIMENTS.

SAVANNAH, GA., May 11.—As the result of the very successful manner in which that portion of Henry street treated with "gas house" coal tar more than six months ago has stood up, more work along the same line has been done. The first experimental stretch of road has been extended about 200 yards and the entire surface of the roadway saturated with the preparation. Farther out, the county commissioners have had about 1-8 mile treated in the same manner at county expense and will continue this into the city limits, so that there will be the better part of a mile of road thus prepared, which is subjected to heavy traffic. It will be closely watched during the summer. F. C. Battey, president of the Savannah Automobile Club, has been a moving spirit in having this work done, and has been successful in enlisting the interest of the county commissioners.

PITTSBURG CLUB PRIZES FOR ROAD REPAIRS.

PITTSBURG, May 12.—By way of encouraging road repairs, the Automobile Club of Pittsburg has offered gold money prizes, aggregating \$175, to the township road supervisors or committeemen who shall construct King split log drags and by their use accomplish the greatest improvement in selected stretches of the main traveled roads under their charge, preferably those connecting with the macadamized roads of Allegheny county. The drag named is a simple device for use on dirt roads, which has been in practical use for the past twelve years with splendid results.

ROAD CONSTRUCTION OUTSIDE DETROIT.

DETROIT, May 11.—With \$90,000 available this year as a result of taxation, and \$12,000 more coming from the State when the work outlined has been completed and accepted, good roads advocates in Detroit and Wayne county are in fine feather. The first bit of earth in what will eventually lead to a system of roads entirely covering the county was turned last week on Grand River avenue, a mile beyond the city limits, by the county highway commissioners, in the presence of State Highway Commissioner Horatio S. Earle and a large gathering of city and county officials and automobilists.

The ceremonies were of a practical nature, a heavy plough coupled to a massive steam engine being used to turn a deep furrow. From now on the work will be pushed with all possible speed, and it is hoped before next winter to have twelve miles of tar macadam road in commission on the principal thoroughfares leading out from the city. This will entitle the county to a reward of \$12,000 from the State, \$1,000 per mile being paid for macadam roads and \$500 for gravel when built in accordance with specifications furnished by the State. Next year it is planned to continue the work on an even more extensive scale, Commissioners Edward N. Hines, John S. Haggerty and William Murdoch having outlined an ambitious program.



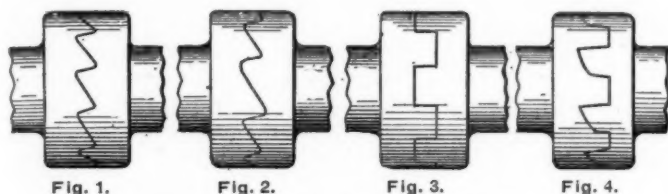
Breaking Ground for Road Improvement Outside Detroit.

AUTOMOBILE CLUTCHES AND THEIR DESIGN*

By HENRY SOUTHER, MEMBER A. S. M. E. AND S. A. E.

CLUTCHES of one form or another, if one may judge from the literature on the subject, have been used since the earliest history of the mechanic arts, an important usage dating far back being in connection with wire drawing. It would seem, however, that clutches in general had attracted but little attention in the engineering world until recently, when they have been called upon to do the delicate work now required of them in connection with cotton mill machinery, printing presses, electric cranes, power plants, and, most recently, with automobiles.

The positive jaw clutch is necessarily used only where the character of the starting action is immaterial, and if sudden,



Various Types of Positive or Jaw Clutches.

matters but little. It obviously can be used only where the inertia of the standing of driven parts is relatively small, otherwise materials could not stand the wear and tear. Modifications of the positive clutch are made in the angles of engagement between the jaws. The least positive form is one where the planes of engagement are inclined backward as regards the direction of motion at an angle of 15 degrees, more or less. The tendency of such a clutch under load is to disengage. It must be held up to its work by an axial pressure, which may be regulated to perform a normal duty, but to slip and disengage when called upon abnormally by some accident or overload.

Positive clutches with engaging planes parallel to the axis of rotation must be held up to their work to guard against a natural tendency to jar out, but they present no safety features against an overload. More extreme yet as to positiveness is the so-called undercut engagement of the jaw clutch, the tendency of which is to engage the tighter when loaded; and which can be disengaged only when absolutely free from load and in a condition to be rotated in a reverse direction sufficiently to overcome the undercut angle. In automobile construction the positive type of clutch is used inside the gear box, so arranged as to be operated only while the main friction clutch connecting the engine with the driven shaft is disengaged. This positive clutch sometimes takes the form in automobiles of an external spur gear meshing with an internal spur gear. Automobile gear changing systems are used that keep all gears in mesh all the time. Each gear carries a positive jaw clutch to be engaged with mates on the driving shaft, while the main friction clutch is temporarily held out of engagement.

Several inventors of merit have accomplished this same thing by a sliding spline, or a hardened ball, on the driven shaft, which engages with the gear hub internally. Such forms are in use, but it cannot be said in common use. It will be seen that this use of a positive clutch in connection with the automobile is one where there is little inertia to be overcome, the mass to be started being only a small shaft within the gear box and the gears on it. The chances are that even these are rotating to some extent in the direction in which they are to continue to move. After this positive clutch is once engaged the main friction clutch comes into play. No drag of the friction clutch is permissible.

*Paper read before the American Society of Mechanical Engineers at New York, May 12. Discussion to be continued at Detroit, June 25-28, in conjunction with the Society of Automobile Engineers.

The starting crank of an automobile is a first-rate illustration of an under-cut positive clutch. It is under-cut so that when the hand is applied to the starting crank there is little or no danger of the clutch slipping off and wrenching the operator. It is a fact, however, that some of these clutches are not under-cut and are disagreeable to handle for this reason.

Classification of Friction Clutches.

A rather careful search of the literature reveals the fact that there are basic types, few in number, involved in all clutches, but that there is an infinite variety of detail of construction and manipulation. Rankine differentiates between friction clutches about as follows:

- Friction clutch (contracting band).
- Friction cones.
- Frictional sector (invented by Bodmer).
- Friction disc (Weston's invention).

Reuleaux illustrates the Ramsbottom clutch as used for rolling mill work. This is nothing more nor less than a friction coupling in which one flange is squeezed between frictional surfaces by being tightly bolted. Referring to Fig. 5, the flange attached to part A is firmly clamped between the wood-lined surfaces of B, adjustment of the bolts being such that the friction will resist normal torque but yield to abnormal torque. This is perhaps the most simple form of friction clutch. It would seem as though some such device might well enter into the transmitting portions of an automobile, so adjusted as to resist up to, say, one-half the elastic limit of the parts involved, and slip under the application of any greater load. Right here it is well to point out, however, that many mechanical devices which have performed well elsewhere have performed badly in automobiles because of the unusually variable conditions to which an automobile is exposed, which might prove to be true of this clutch.

Reuleaux then shows as the next step in the development of the clutch a cone coupling, the two parts being forced into engagement by screw and handwheel B, as shown in Fig. 6. He states that the angle of the cone should not be less than 10

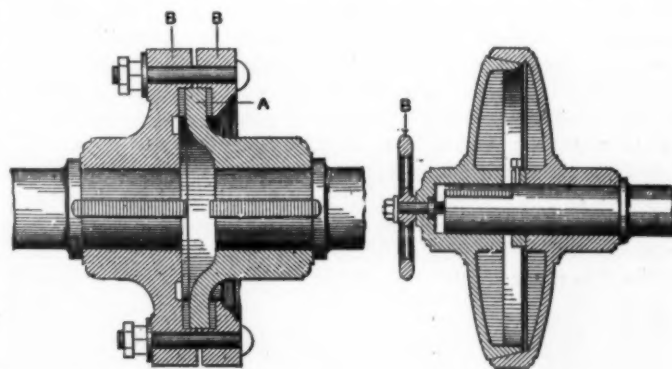


Fig. 5—Ramsbottom clutch.

Fig. 6—Cone clutch.

degrees, in order that the parts may not become wedged together. He also gives in connection with this clutch with frictional surfaces of iron on iron a coefficient of friction of 0.15. In order to keep the axial pressure within reasonable limits, he places the mean radius of the cone between three and six diameters of the shaft. Following the single cone clutch in Reuleaux is what might be called a multi-cone, as shown in section by Fig. 7, a series of concentric cone-shaped rings with angles of 10 degrees, or 20 degrees for both halves of the cone. As shown in this cut, it is apparent that the collar would have to resist the pressure and wear due to the axial pressure necessary for proper engagement. This would be serious.

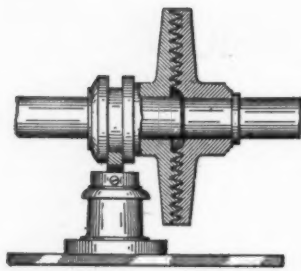


Fig. 7—Multi-cone clutch.

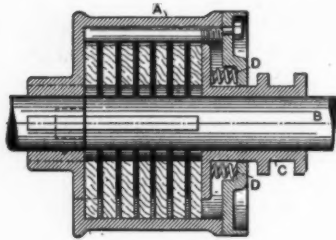


Fig. 8—Weston clutch.

Such wear is avoided in heavy machine work or in high-speed automobile design by making the axial pressure self-contained on the rotating member, except when the clutch is in the act of being disengaged. Such construction as this has been found absolutely necessary in connection with all automobile clutches. This modification of the foregoing is shown in Fig. 9. The pressure of the screw wheel is self-contained, the two halves *A* and *B* being clamped together by it, the concentric double-faced cones furnishing much friction at slight axial pressure.

The next clutch shown by Reuleaux is that which he attributes to Koechlin, Fig. 10. This is of the internal expanding type, three internal clamp pieces, *A*, fitted with bronze shoes, being thrust out against the enclosing cylindrical drum *B*, by means of lever and screw action. Reuleaux points out the fact that there is no danger of wedging in this clutch, as exists in connection with the cone clutch. Reuleaux next shows a form of "axial friction coupling," well-known as the Weston clutch, based on the principle of multiple plate friction, Fig. 8. The plates are alternately wood and iron, as indicated, the wooden ones engaging with the outside cylindrical containing-case *A*, and the iron ones with the shaft, *B*. In the form shown, the plates are pressed together by springs, *D*, and released by drawing back a collar, *C*, which releases the spring pressure.

Some Machine Shop Clutches.

The foregoing reference to Reuleaux will serve to fix in mind the fundamental or basic types of clutches, and I will now give a number of illustrations to show the development of the machine shop clutch from the earlier forms already illustrated. Perhaps the simplest is the type in which one flat disc presses against another, the surfaces being leather against iron, bronze against iron, or wood against iron, the axial pressure being great enough to drive the maximum load, yet not so great but that slipping takes place when the load is first applied, which prevents all jar. Such clutches are familiar in the driving of looms.

In Fig. 11 is a modification of the Weston type. It is not multi-disc, there being only one wooden disc *A*, attached to the enclosing case *B*, which is gripped between two iron surfaces *C*, keyed to the driving shaft. To prevent any drag when disengaged, separating springs *D*, are supplied, which part the frictional surfaces when idle. Slight rubbing when idle is not a

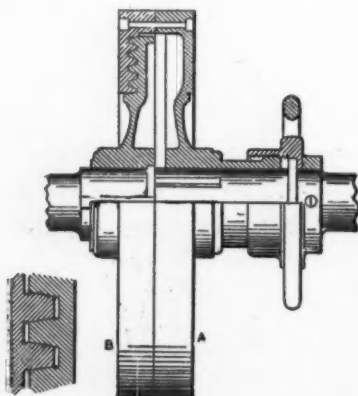


Fig. 9—Self-contained thrust.

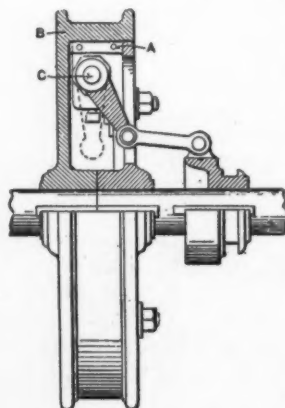


Fig. 10—Expanding type.

very serious matter in machine shop clutches, however, but its importance in connection with automobile clutches I will bring out later. It is interesting to note that very little information is given or obtainable in regard to the frictional capacity of these machine shop clutches. Correspondence with the manufacturers reveals the fact that knowledge of the capacity of their clutches is of an empirical character. The coefficient of friction of maple (which is commonly used by them) on cast iron is known. Little use can be made of this knowledge, however, as the degree of lubrication, or lack of it, may easily double or halve this coefficient. The manufacturers have learned by experience what size clutch of their own make is necessary for the transmission of a given horsepower. Catalogues usually give the horsepower that can be transmitted at 100 r.p.m. It is probable that information of this kind, untechnical though it be, is decidedly more reliable than that obtained from any formula containing an unknown variable—the coefficient of friction.

What was formerly known as the Frisby clutch was designed many years ago when no attention was paid to mathematical design, but its capacity has been well established by experience. Fig. 12 shows this clutch, which is not unlike the last one described, except that a flat surface *A*, and cone *B*, are used in combination. The gripping of the surfaces is accomplished in very much the same way. The frictional surfaces are sepa-

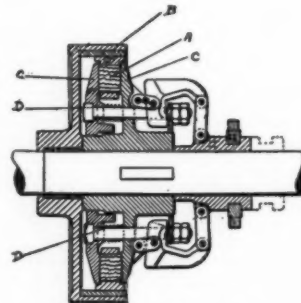


Fig. 11—Modification of Weston type.

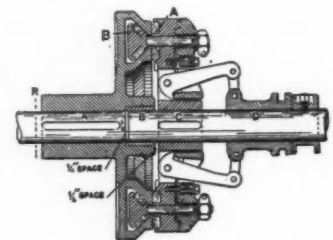


Fig. 12—Combined cone and flat surface.

rated by springs when disengaged. It is apparent that this clutch would require less axial pressure for any given horsepower transmitted than the foregoing type because of the cone; or, in other words, for a given axial pressure would transmit more horsepower, and, therefore, would be smaller and more compact, all other things being equal. But here again is the uncertainty of the coefficient of friction. This clutch, for example, might throw its oil to the frictional surfaces more than the previous example, which oil would more than offset the effect of the cone engagement.

Clutches of Small Dimensions.

A strong demand has developed for a clutch of very small dimensions for a given capacity. This demand has been met in rather a curious way. Instead of cast iron or metal of ordinary strength, hardened tool steel frictional parts have been resorted to. This permits exceedingly high normal pressures between the frictional surfaces. As much as 100-horsepower has been transmitted at 1,000 r.p.m. with a clutch containing friction rings 5 1/4 inches diameter and 1 1/2 inches wide. This form of clutch has been largely introduced into automatic machines, machine shop countershafts and launch engines. Its engagement is apparently soft enough for any of these purposes, but in connection with automobile service it is yet in the experimental stage.

Clutches with Cork Friction Surfaces.

In connection with the commercial clutches of the forms now under discussion, cork has recently entered the field to a considerable extent and apparently with considerable success. It has a high coefficient of friction, probably double that of wood

The axial pressure in connection with such clutches is usually furnished by a spring disc; that is, the steel plate which carries the frictional surface, either leather or copper, is caused to operate like a diaphragm spring. The amount of normal surface pressure is not known in most cases as far as I have been able to learn. The above figures in this regard were furnished by the Cadillac Motor Car Company, of Detroit. The diameter of a clutch of this kind ordinarily used to propel a car of 7 horsepower or 8 horsepower is from 5 inches to 10 inches, the rubbing surfaces being about one-half to three-quarters of the entire superficial area of the disc. Such clutches are mostly available for two-speed cars, the disc clutch connecting with the engine direct and running at engine speed, the planetary system being used only for low speed and reverse work, actuated by contracting band clutches.

Motor vehicles so geared have their uses, but early in the development it was found that three or four speeds were desirable. Boxes of sliding or change gears were resorted to, and here the character of the clutch became of prime importance. To be satisfactory, an automobile clutch used in this manner must engage and disengage easily, requiring but small axial movement of the operating mechanism, or of the clutch itself. It must be entirely independent of centrifugal force, and able to slip for a reasonable length of time without being destroyed.

The matter of absolute disengagement is perhaps the most important. Without it the sliding gears intended to be operated when the clutch is free or disengaged cannot be unmeshed nor remeshed. The slightest drag or friction in the clutch means a savage clashing of gears when changed. This means the destruction of the gears and the failure of the entire system of gear change. The early history of the art is full of failures in the matter of successful construction and operation of the so-called sliding-gear transmission. Gears with the teeth worn away were the rule rather than the exception. This wearing was, no doubt, due to the imperfect disengagement of the clutch. The use of a system of gear change requiring the clashing of moving gears cannot receive the complete approval of the engineering world; yet this system has become a success by a combination of improvements in clutch and materials of which the gears are made, and treatment of the materials.

An important feature in the clutch is the question of its weight, especially as affecting its inertia. A clutch having high flywheel effect spins to such an extent as to cause violent clashing of idle gears. Consequently, clutches are made as light as possible, and the smaller in diameter the better. Aluminum enters largely into clutch construction for this reason. The spinning of the clutch has been met in many automobiles by a so-called clutch brake—a retarding finger which operates in connection with the clutch disengaging lever and bears upon some portion of the driven member of the clutch, braking it to a standstill.

One inventor has gone still further in this direction and disengages the driven shaft both before and behind the gear box. This invention is such that the friction clutch opens first, immediately followed by the opening of a positive jaw clutch behind the gears and then braking of this disconnected driving shaft, as just described. This permits the engagement of gears that are absolutely free and stationary. It may be well to bring out the fact, however, that this invention is open to one objection, and that is that the gears may stop in such a position as to make it difficult to mesh them.

Any automobile clutch must engage smoothly and absolutely without shock to be called a success. The quicker it seizes without shock the better it is. Clutches exist that can be engaged suddenly and still not jar the passengers. But such a clutch is open to one very serious objection; that of not picking up the load quickly enough on a hill to start the car forward after a change of gears, before the momentum of the car is materially lessened. For example, in changing from the high gear to the next lower on a steep hill, a clutch that is too soft will permit the speed and momentum of the car to drop to such an extent that when the clutch finally does take hold the car is nearly at

a standstill. This necessitates a further drop into a lower gear; one that will start a car from a standstill on a hill. The clutch designer is, therefore, between two fires; too little slip on one hand and too much slip on the other. A degree of slip between the two must be found, and once found be capable of being maintained. It is doubtful if such a problem exists in connection with clutches anywhere else in the mechanical art.

The customary location for an automobile clutch is within the flywheel or at least at the rear end of the engine, if the flywheel is at the front end.

The application of the multiple disc type takes very little room between the gear box and the clutch, and would be too close construction (as will be shown later) for the application of the cone type of clutch, which requires so much flexibility back of the clutch.

Details of the Cone Clutch.

I will take up the simplest form first, namely, the cone. I am pretty well satisfied, that, all things considered, it is the best form when properly designed and mounted. It has the advantage of engaging and disengaging with very small axial motion. Axial pressure may be low because the normal pressure between frictional surfaces is multiplied by the angularity of the cone. Its weight may be very small, as the male member may be of aluminum. Its engagement is entirely independent of speed and centrifugal force. No liquid lubricant is needed with attending viscosity, drag and change due to wear and temperature. Disengagement may, therefore, be made perfect.

Proper engagement, however, has proven to be a very difficult and baffling problem. I think it safe to say that this difficulty has caused nearly all the rejections that have occurred of the cone clutch. A cone clutch may operate almost as savagely as a positive jaw clutch. It may also refuse to engage, if it does not have the proper combination of angularity, pressure and lubrication. It may behave well at times and very badly at other times. A cone clutch of given angles and dimensions, with a definite axial pressure, may be a success in one car and an absolute failure in another.

The cause of this contradictory behavior may not be and often is not in the clutch proper; but, on the contrary, in the surrounding mechanism of the clutch. The cone clutch must be absolutely free to center itself and seat itself uniformly. A short Oldham coupling or a single universal joint between the clutch and the driven shaft of the car is not enough to permit this under all conditions. The weaving of the frame of the car puts cross strains on such a coupling, causing it to bind and causing the clutch to seize on one side before the other and be drawn suddenly into full contact. A change of angle, increased lubrication and a change of materials on the friction surface will not remove the trouble arising from this cause. A pair of generous, free working universal joints must be provided, in order that the cone shall reach its seat as intended.

Similarly, an engine mounted on a flexible sub-frame or pan support may move sufficiently to prevent the proper seating of the cone and cause a similar line of troubles. The male member must be mounted so as to be flexible enough to follow such small movements. Experience has been a long time in teaching engineers that so much trouble can arise from apparently so small a cause; yet there are cases where misbehaving clutches have become well-nigh perfect by the introduction of flexible couplings.

Leather (riveted onto an aluminum cone) usually forms one of the rubbing surfaces and gray cast iron the other. It is desirable that the leather shall be kept soft by neatsfoot or castor oil. Some builders boil the leather in tallow before applying to the clutch surface; others do not, but this matter is of minor importance compared with the mounting. With leather 1-4-inch to 3-8-inch thick, properly softened, engagement may be sufficiently mild, but an improvement is obtained by placing under the leather at six or eight points on the periphery of the cone flat or spiral springs that cause the leather to engage at these points a little bit before engaging elsewhere.

(To be continued next week)

LETTERS INTERESTING AND INSTRUCTIVE

EXCESSIVE CURRENT CONSUMPTION CAUSES.

Editor THE AUTOMOBILE:

[1,351.]—In "Letters Instructive and Interesting" of the issue of the 30th, we note No. 1,335 letter regarding a coil vibrating when the spark plug is disconnected from the engine. Now we have just purchased a new Buick, and we find that the secondary wire can be disconnected from the plug on one engine and the coil buzzes just the same. Now from your answer to No. 1,335 we cannot take that our coil is working right. If our coil is short-circuited, would it cause our batteries to run down more rapidly than otherwise? That seems to be our main trouble. A new 60 ampere hour storage battery and 5 new dry cells only run the machine about 600 miles. Would you advise an Elsemann magneto for a two-cylinder car?

Ravenna, O.

G. W. CURTISS.

Our answer to Subscriber, Fair Haven, Vt., in this issue serves to reply to the first part of your letter. The coil should vibrate whenever a current is sent through its primary winding, but it should not vibrate simply because the spark plug is removed. In other words, the operation of disconnecting the plug should not cause it to vibrate independent of other causes. But the mere fact that the coil vibrates with the plug disconnected does not show anything one way or the other. If the coil were short-circuited, it would not work at all, and the batteries would be run down in a very short space of time, probably not more than half an hour. Either dry cells or accumulators should run your car 1,500 to 2,000 miles or more, without becoming exhausted. In all probability you will find that the coil vibrators are so poorly adjusted that they are taking an excessive amount of current. To remedy this, test them with a coil current tester, or low-reading pocket ammeter, which has a scale reading from zero to 3 or 5 amperes by tenths.

Disconnect the battery from the coil to be tested, and connect this wire to one of the terminals of the instrument; connect the other terminal of the meter to the coil where the battery wire was taken away, thus inserting the ammeter in the primary circuit. The engine should then be run and the adjusting screw of the coil vibrator turned up or down, until the engine will run steadily on a current consumption not exceeding .50 to .75 ampere. The needle will flutter constantly, but its range of movement is not sufficiently great to interfere with effecting the adjustment. Do the same thing with the other coil. If you will adjust both coils not to take more than .75 ampere, you will find that the batteries last twice as long. Take a look at the timer also, to see if there is anything wrong with it. An Elsemann magneto is an equally valuable investment on a two-cylinder car as it is on any other, but it is not so much of a necessity owing to the fact that the two-cylinder car of the four-cycle type only fires once per revolution, as compared with multi-cylinder motors.

EXPERIENCE WITH INTERNAL TIRE PROTECTORS.

Editor THE AUTOMOBILE:

[1,352.]—Being a subscriber, I would like to know your experience, if any, with internal tire protectors, a series of steel discs laid in a band of canvas, and set between the tube and the shoe. If you have no personal experience of which you can advise me, I would appreciate it to know what faults, if any, have come to your knowledge regarding these protectors.

E. EISEMANN.

New York.

We have never had any experience with devices of the type you mention, nor have we ever heard of the particular one that you speak of having developed any faults, which means, in short, that we have not heard anything concerning it in actual use. The idea looks attractive at first sight, but whether it is practical or not has to be determined by experience. If any of our readers have used these internal tire protectors we should be glad to hear from them, publishing their experience in these columns.

MORE ABOUT COIL VIBRATOR DIFFICULTY.

Editor THE AUTOMOBILE:

[1,353.]—I note in your answers to letters No. 1,311 and No. 1,335, that you state the coil should not vibrate when the wire is disconnected from the spark plug. Now I have tried this on a number of types of motors and the coil always vibrates when contact is made at the timer, whether the spark plug is connected or not, other connections being all right. Now, why should not the coil vibrate? I think your answer is misleading, as you perhaps misunderstand No. 1,311's letter.

A SUBSCRIBER.

Fair Haven, Vt.

Upon rereading letter No. 1,311, in the light of your communication, we can see where the answer thereto is misleading to a certain extent. In stating that the coil should not vibrate when the plug was disconnected we did not intend to imply that this should not be the case simply because the plug was not connected up, but that the operation of disconnecting the plug should not cause the coil to vibrate. As the vibration of the coil trembler is caused by the current passing through the primary coil and energizing its core, thus attracting the vibrator armature, the latter interrupting the current by its movement, this operation is entirely independent of the spark plugs, or, for that matter, of the secondary winding of the coil, and if the coil will not vibrate when contact is made at the timer it is naturally to be inferred that there is something wrong with the battery or the connections. The closing statement of the answer in question, that "the coil should only vibrate when contact is made at the timer, as intended," should cover this point.

ATTEMPTING TO DEFINE THE STOCK CAR.

Editor THE AUTOMOBILE:

[1,354.]—The Automobile Club of Wilmington is planning to hold a road race for stripped stock cars, and I would thank you very much if you will answer the following questions through your "Letters Interesting and Instructive," so that we may get some definite ideas as to what constitutes a stock car.

1. Is it permissible to change the gear ratio from that supplied on the car when delivered from the factory?
2. Is it permissible to increase the size of the rear wheels so as to increase the speed of the car without increasing the gear ratio?
3. Is it permissible to remove the entire body and substitute instead a body of different type?
4. Is it permissible to remove the gasoline tank and substitute a smaller one, so as to take up less space?
5. Is it permissible to substitute flatter and lighter springs so as to bring the center of gravity nearer the ground?
6. Is it permissible to attach a tire pump to the gasoline tank so as to pump air into said tank to cause the gasoline to more readily flow to the carbureter, if this car when shipped from the factory is supplied only with a gravity feed?
7. Is it permissible to increase the compression of the motor by placing plates either on the top of the pistons or in the top of the compression chamber?
8. Is it permissible to install a type of carbureter different from that originally supplied by the manufacturer?
9. Is it permissible to install a magneto on a car not equipped with one by the manufacturer?
10. Is it permissible to remove fenders, mudguards, running boards, dustpans and mufflers? If it be permissible to remove fenders, is it permissible to install instead fenders of lighter construction?

Our rules as drawn up merely provide that all entries shall be stripped stock runabouts listing for \$900 or less, as equipped by the manufacturer.

BURKE H. BRIDGEIS.

Wilmington, N. C.

1. This is commonly done, but we do not think it should be allowable, as, if the car is geared especially for racing, as is the case where the change is permitted, it is no longer a stock car.

2. The answer to question No. 1 would apply to this equally. Taking the meaning of the phrase "stock car" in its every-day significance, it is evident that such changes would not be allowable, as it would not be possible to go

to the manufacturer's plant and pick out a car with an unusually high gear or unusually large wheels. They would be the same on the whole series of cars of that model being turned out, and altering them in such important essentials would be radical changes made solely for the purpose of gaining extra speed.

3. Yes. The usual racing seats are generally allowed. This does not change the chassis in any particular, and this, after all, is the "car."

4. Changes in the gasoline tank are also permissible, a larger one generally being employed.

5. This is another alteration that would take the entrant out of the stock car class, as with special springs it would not conform to the requirement that the maker should have built a certain number of duplicates of the car entered.

6. Special arrangements for feeding fuel and lubricating oil are usually permitted, as they are usually necessary to sustain high speed for any length of time.

7. Naturally not. Nothing could be further from the definition of a stock car than one which had been tinkered with in this manner. The product of such expedients would be something that was neither a racing car nor a stock chassis.

8. Interpreting the requirements strictly, this would not be permissible.

9. The answer to the preceding query would also cover this, but in view of the fact that both carbureters and magnetos are purely accessories, and, in the case of low-priced cars, seldom, if ever, built by the maker of the car, it would not be necessary to stretch the rules very much to make substitution of either of these essentials permissible.

10. As such races are always for "stripped" stock cars, this naturally permits of the removal of such superfluous parts as fenders, and it is equally allowable to substitute others of a lighter nature, such as strips of cloth. Racing rules for such cars sometimes permit the removal of mufflers, and in other cases merely allows them to be cut out, but not removed. Their removal, however, would appear to be a legitimate part of the stripping process.

The statement following your queries concerning the definition of a stock car, and which ends "as equipped by the manufacturer," would appear to us to put an effective quietus on any attempt to change gear ratios, wheels, carbureters, install a magneto or undertake any of the numerous expedients that you have mentioned, as any one of them would be digressing this very important part of your rules. It seems to us it should not be difficult for you to settle the question, as any low-priced car is a stock car pure and simple, in the shape that its owner purchases it. Removing fenders and the like and putting on special racing seats makes it a stripped stock car. What more is there to it?

GOOD SUGGESTIONS FOR FORD OWNERS.

Editor THE AUTOMOBILE:

[1,355.]—I was much interested in letter No. 1,324, by Charles Gilbert, explaining changes which he had made in the gasoline pipes on his Ford runabout. Once or twice last summer I had similar trouble, although did not find out at the time what was the cause. I wrote the Ford Company, who advised me that the location of the gasoline connection was too close to the exhaust and should be changed, as they have been doing for quite some time, in their later cars. On reading the above letter, I at once saw a simple way of accomplishing this, and for the benefit of others will explain just what I did. I obtained from a plumber's supply shop a 1-2 inch diameter by 11-2 inch nipple, a second one 1-2 inch by 4 inches, and two elbows to fit. I found these dimensions correct, so that the location of the parts was exactly in the right place when reassembled. I attach herewith sketch showing this arrangement, and would suggest that each owner of the Ford cars which have the hole in the gasoline tank almost directly over the exhaust pipe, should make this change. This will remedy a great majority of their so-called "carbureter" troubles. The cost of these four parts is about 50 cents. Be sure to get them of brass, however.

A very tantalizing trouble which I have had recently and how I overcame it might also be of interest. Very frequently No. 3 cylin-

der would fail to explode, and the trouble seemed but slightly remedied after putting in new primary wires. I then thought that perhaps the trouble might be in the commutator, and while it appeared clean, I nevertheless put a little piece of emery cloth on a little stick and polished the No. 3 contact point in the commutator, then thoroughly washed all dust and dirt out with gasoline, and have not had a misfire since.

I hope that some of your readers may be benefited by the above suggestion.

W. S. HAGAMAN.

Sharon Hill, Pa.

The manner in which you diagnosed the difficulty and overcame it is not alone very interesting, but should prove valuable to numerous owners of similar cars. We have noted the sketch showing the change, but as it is practically the same as that submitted by Mr. Gilbert have not reproduced it.

WORTH FIFTY TIMES A YEAR'S SUBSCRIPTION.

Editor THE AUTOMOBILE:

[1,356.]—Through your "Letters Interesting and Instructive" I have gained more general knowledge of details of the ordinary automobile engine than can be gotten for fifty times the cost of your paper, but there is a question that has not been answered, to my satisfaction at least. Will it be wise or unwise practice to use a paste of cylinder oil (good grade) and graphite, half and half, to lubricate and reduce noise in a selective sliding gear transmission and roller bearing differential assembly? Desire to thicken lubricant to prevent throwing out at bearings and brake hubs respectively.

W. H. GERHARD.

Austin, Texas.

This practice is highly recommended by some authorities and at least one manufacturer turns out a special compound consisting of graphite and wood chips or shavings especially intended for use in change speed gears. You will find an inquiry concerning this subject in the issue of THE AUTOMOBILE of April 23, page 569, Letter 1,321, together with the answer thereto, and we are since in receipt of a letter which is published in last week's issue of THE AUTOMOBILE, stating that the writer had tried various forms of sawdust without satisfaction and had found that cork filings and oil gave the best service.

COMPOUND FOR FILLING PNEUMATIC TIRES.

Editor THE AUTOMOBILE:

[1,357.]—Will you please give me, through "Letters Interesting and Instructive," a formula for some good compound to fill tires with?

A SUBSCRIBER.

Portsmouth, O.

We do not know a good formula for this purpose and consequently hesitate to give you any. Common sheet glue and molasses in the proportion of one pound of the former to three pints of molasses will make a puncture-proof filling, but it will not be all that is desired by any means. Any good formula of this kind is naturally a trade secret and is likewise beyond the reach of the amateur to duplicate successfully, as it is necessary to put it into the tires under considerable pressure, requiring special machinery. Once a tire that has been treated in this manner shows signs of failing, the only thing to do with it is to throw it away, as it cannot be repaired and is of no further use.

REPAIRING A LEAKY HONEYCOMB RADIATOR.

Editor THE AUTOMOBILE:

[1,358.]—Will you please favor me with directions for repairing a leak in my radiator? The leak is a slight one in a "honeycomb" type radiator, and I believe that it is possible sometimes to repair such a leak without taking down the radiator and soldering it. If a repair can be affected by running some solution through the water system, I am sure that any information that you can give on the subject will be of great benefit to others as well as to myself.

Pasadena, Cal.

J. H. STONE.

There is no way of repairing such a radiator, or any other type for that matter, by merely injecting something into the cooling water. At least we do not know of any. We should advise taking the radiator down and having it soldered by a good mechanic, as a bungler with a soldering iron will do more damage in ten minutes than can be repaired in half a day. It is a delicate job and requires a good hand.

ARE SPECIAL STEELS ONLY A FAD?

Editor THE AUTOMOBILE:

[1,359].—During the past two or three months there has been appearing in the daily press a certain short article which recurred with some frequency in different papers, with an occasional change of wording, and which conveyed in substance the impression that "special steels" are of no special value in automobile construction, except perhaps here and there, for the purpose of reducing the weight of a part. The note has usually been coupled with the name of Hayden Eames, and with the output of certain automobile factories, and the "special steel" has been contrasted with "50 carbon" steel as a material supposed to afford all the strength required. Finally this same item appeared a few days ago in two New York dailies, and, as it deals with a subject of enduring interest to the public, as well as to automobile manufacturers and to the whole independent section of the steel-making industry, I wish you would kindly allow me space for some remarks intended to present this subject in a more correct light.

From the standpoint of economy, a good deal may be said in favor of simple, ordinary carbon steel, so long as the carbon content does not exceed about 15 "points," meaning 15/100 of 1 per cent. Such steels may be handled successfully by the average workman. They may be successfully surface-hardened for gears, and the danger of overheating them in forging is not great. But, with higher carbon content the case is different. A 50-point carbon steel is difficult to forge, easily spoiled by overheating, and when used for gears, either too brittle or not hard enough. Its "life," or durability under shock and alternating stresses, is short, or at least precarious, and it is, in fact, the principal mission of "special steels" or alloy steels, as they are more commonly known, to obviate just those difficulties encountered when increased strength is sought through increased carbon content in ordinary steel. The most valuable alloy components are not only hardeners, as carbon is, but also tougheners, which carbon is not.

Mistakes have been made, to be sure, in alloy steels, especially by having their carbon content too high, but it is easily possible at the present stage of progress in alloy steel manufacture to select alloy steels which possess greater strength than 50-point carbon steel, and which couple with this greater strength, greater toughness than is possessed by any ordinary steel, and also perfect suitability for surface-hardening and much increased life under the shocks to which all automobiles are subject.

The principal error which has been committed so far with regard to special alloy steels has consisted in failure to draw a sharp line between the safe, low-carbon, alloy steels, on one side, with their moderate but distinct all-around superiority over ordinary low-carbon steel, and the more ultra alloy steels which promise superlative possibilities for special purposes, if made just right and worked just right, but in which the dangers of any high-carbon steel for construction purposes are accentuated. This division line among alloy steels is only the same which experience in other industries has drawn between ordinary low and high-carbon steels.

Alloy steels have had a vogue, it is true; and some have suffered by following the vogue rather than the sense behind it. Now the pendulum is swinging back, and the time may seem favorable for pronouncing 50-point carbon steel good enough, since it is economical to the manufacturer by its relatively low price, and economy is a perfectly legitimate consideration. But it proved a failure in bicycles; it has been definitely rejected as construction material for racing cars and in ball bearings, and for every other application in which the presence or absence of the properties required for continued resistance to shock is subject to rapid and conclusive demonstration. It makes good shovels and good ploughshares, but in automobiles it is less economical to the owner than to the maker, although it should perhaps be admitted that a capable designer may steer a moderately safe course, commercially speaking, between too much weight, on one side, and too short life, on the other, and yet use nothing but ordinary carbon steel.

In order to produce the greatest value, however, it is the low-carbon alloy steel which affords the most suitable, and, in the long run, the most economical construction material from which to build automobiles for severe service, just as it has already been abundantly proved to be the highly specialized alloy steel of high carbon, which affords the most economical material for tools for all purposes requiring hard work and long life. There is still left a large field for simple low-carbon steel in the construction of cheap automobiles intended only for very light work and low speed. But the field for simple high-carbon steel lies in other spheres with which the purchaser of automobiles, as such, has little to do.

While convinced that a clipping bureau or advertising agency, rather than Mr. Eames, is responsible for the press notices which have been so widely copied and in which simple high-carbon steel is recommended as construction material for automobiles, I would suggest that a public discussion of the subject would be timely, and to this end I propose the following theses:

1. There are alloy steels, of 10 to 30-point carbon, offering very nearly the same facilities for forge work and surface-hardening as ordinary steels of same carbon contents.

2. These alloy steels, referred to under 1, are not only superior to ordinary low-carbon steel in strength and durability, but are proven stronger than ordinary 50-point carbon steel by all static tests, and much tougher and more durable than ordinary 50-point carbon steel by all dynamic and shock tests.

3. The only point of superiority of simple 50-point carbon steel (whether basic open hearth, acid open hearth or crucible) over the low-carbon alloy steels referred to, lies in its lower price.

4. Alloy steels should not be used to reduce the weight, but to increase the durability of automobiles.

New York City.

MARIUS C. KRARUP.

AN EFFECTIVE WAY OF LOCKING A CAR.

Editor THE AUTOMOBILE:

[1,360].—There are many reports from various cities of automobiles being stolen while standing unattended, particularly in the evening, and it struck me that there should be some simple method of locking a machine, beyond the general custom of taking away the switch key. I worked out a little device on my own machine and which I offer to your readers for what it is worth.

My clutch pedal when thrown out comes to within about six inches of the dashboard. I have therefore attached to the dash where it joins the floor a good solid plate staple through which I run a chain around the clutch pedal, bringing the two ends of the chain together and lock them with a brass padlock, and with this device attached and my emergency brake on I defy anyone to make off with my car. The device is so simple and the total cost runs under \$1.50, so that it seems to me a pretty good "insurance."

Detroit, Mich.

S. C. STEARNS.

COOL RUNNING WITH THE FAN BELT OFF.

Editor THE AUTOMOBILE:

[1,361].—Some time ago I had occasion to go to a house a few miles out in the country. When I arrived I noticed the water boiling furiously in the radiator. On looking inside, I found the belt which drives the fan had broken and was lost on the roadside somewhere. As the weather was clear, the roads not dusty, I took off the hood entirely and ran home without the use of the fan. The water never boiling and the engine as cool as ever. This may be a trifling item to report and it may have been done hundreds of times before, but it is often these little almost self-evident things which we forget to mention.

Richmond, Va.

M. D. HOGE, JR., M.D.

EXPLAINING THE MAXWELL OWNER'S TROUBLE.

Editor THE AUTOMOBILE:

[1,362].—In reply to letter No. 1,320, would say the Maxwell oiler is of the compression type. After the car is stopped the oil will feed as long as there is compression left in the crankcase. As the pistons generally stop farthest from compression and the rings become worn, quite a quantity of oil will find its way into the firing chamber. And this makes the motor start irregularly and smoke until the cylinder can clear itself through the exhaust. Try loosening the screw cap at the top of oiler when you stop the car.

Hightstown, N. J.

R. W. NORTON.

HELP FROM A SOUTHERNER FOR MR. RADWAY.

Editor THE AUTOMOBILE:

[1,363].—In reply to Charles J. Radway, in your issue of April 23, letter No. 1,320, would say he will find his trouble in the valve seat on the stem of his float, either from a sprung stem or a bad seat. When the motor is stopped, it lets too much gasoline in the carburetor. If he will see that the float valve shuts off all right his motor will start and not miss with the spark retarded.

Greenville, S. C.

FRED H. COOPER.

HOW THE INQUIRER MAY REMEDY TROUBLE.

Editor THE AUTOMOBILE:

[1,364].—Seeing in "The Automobile," issue of April 23, a Maxwell touring car owner having trouble when starting, will say that a Schebler carburetor will fix this, and if this does not, a new exhaust valve spring will. He will also find a stiff wire brush (sold by the Maxwell people), to clean his cylinders out, a great help. This fixed our Maxwells.

Berthoud, Col.

BERTHOUD AUTO COMPANY.

SUGGESTIONS FOR A PUZZLED AUTOIST.

Editor THE AUTOMOBILE:

[1,365].—In answer to letter No. 1,320, in your issue of April 23, I have a Maxwell two-cylinder touring car and experienced much the same trouble. Think he will find the cam and contact blocks of his commutator worn, or the spring weak. It would be well for him to examine them.

Carroll, Ia.

E. N. MERCHANT.

FARMER, ACCUSTOMED TO MACHINERY, CAN "USE" AUTO

FROM THE NATIONAL GRANGE OFFICIAL ORGAN PATRONS OF HUSBANDRY—N. J. BACHELDER, EDITOR-IN-CHIEF.

A FEW years ago a very strong feeling prevailed in the rural districts against the automobile. This was due to the fact that farm horses were not accustomed to the so-called "go-devils," and accidents were by no means uncommon. For a time there was an effort to create a sentiment against the automobile so as to legislate it out of existence, but that feeling has almost entirely passed away. Concessions made on the part of automobile owners and the exercise of a greater degree of tolerance on the part of farmers have amicably solved the whole difficulty, the result being that the automobile among all classes is more popular to-day than ever. With the increase in the number of machines used driving horses have become more accustomed to them and accidents to-day are few and far between.

We are acquainted with a few farmers who own an automobile, and we find that these machines are more highly prized by those who make use of them on the farm than they are by the city man. As the farmer is accustomed to handle machinery, he is able to "use" and not "abuse" his machine, and as he is his own machinist, he keeps it from getting out of "kelter" by always having it in the best of running order. He knows that

it is not the wear and tear during use that is hard on farm machinery, but the lack of care, and, fortified by this knowledge, he can get much greater service out of an automobile than can the average man who possesses no ability as a mechanic.

Horse feed in these times comes high, and the horse eats whether he works or not; the automobile, while it is standing still, costs nothing to maintain. A twenty or twenty-five-mile journey is a day's work for the average team, while with the automobile this distance is covered in about an hour. As the King road drag comes into more general use, the automobile will increase in popularity, in our opinion, because it satisfies a real need on the farm. It is not necessary for us to enumerate the uses to which it can be put, as each farmer knows full well how often he can use a good driving horse or a good team if these are available, and when you consider that the time of a horse can be cut in two, and even better than that, the conclusion must be reached that the automobile will be of the greatest service to humanity when it becomes the distance annihilator for the farmer, as it now is for the large body of automobilists who recognize its value for getting over the ground quickly.

PHYSICIANS TELL OF THEIR GREAT USE OF AUTOMOBILES

AS a class, the automobile has no more consistent and more loyal set of users than the medical fraternity. First and foremost, the doctor invests in an automobile for business use; it will take him where he wants to go—where he is needed, often very urgently—in a fraction of the time any other method of transportation at his command can possibly do. It will take him long distances in a very short time, and robs the country practise of much of the hardship attendant upon long drives in bad weather and at all hours of the night. It is no less valuable or less useful to the medico whose practise lies within the confines of a city. So that it is scarcely to be wondered at that doctors comprise a very large portion of the total number of auto users. Likewise, doctors form a very substantial fraction of the buyers of Rambler cars, and, on this account, Thomas B. Jeffery & Company, Kenosha, Wis., have made the May issue of the *Rambler Magazine* a special physicians' number.

It is a thirty-six-page booklet, gotten up in an attractive typographical dress, and is replete with attractive photographs of the doctors and their Ramblers all over the country. It is not alone one of the most pretentious efforts of the kind ever produced by the publicity department of any automobile manufacturer, but it is also the biggest thing of its order ever attempted, as an edition of no less than 50,000 copies has been printed, so that one will be placed in the hands of every doctor from Maine to California. In addition to the very numerous photographs of doctors and their machines, which serve to illustrate this special issue of the *Rambler Magazine*, there are a number of interesting articles contributed by physicians, showing how the ownership of an automobile is something without which the modern doctor is badly handicapped.

But it is not all business by any means, for the doctors, as well as other people who buy cars, do so for the double purpose of getting round where they are wanted and of giving enjoyment to their families of a nature that only the automobile can provide. So the wielders of the knife and the administrators of pills and lotions are also shown in their hours of ease, toward which their cars contribute so greatly, as well as on duty bent. Nor are they all Ramblers of the latest vintage that the makers have pictured in the pages of this unusually attractive issue of the magazine, as some of them date back to the earliest days. For instance: "I have worked my car hard since 1903," says

Dr. R. M. Tafel, of Phoenix, Ariz., "and feel as kindly toward it as I do to the family horse. I bought my car for work, and not for pleasure, and am glad to say that the repairs on it have been trifling."

"Four years without repairs," says Dr. J. C. Carson, of Valparaiso, Ind. "My practise has grown greatly since I got it, and after having made 15,000 miles, my first Rambler was sold on its reputation for only \$300 less than what it cost originally." This is the general tenor of the experiences outlined in the magazine, though some go into detail to a greater extent, showing that even without considering the vastly greater service rendered, the automobile is a better investment for the doctor than a horse.

Says Dr. A. H. Robinson, of Kenosha, Wis., on this point: "Two years' experience with a Rambler in my practise, after eighteen years' experience with a horse, has convinced me that I can do double the amount of work with an automobile and yet have more time for recreation." This, in fact, sounds the keynote of the value of the automobile to the physician, as it prevents him from being bound down to his work for eighteen to twenty hours a day. Continuing, Dr. Robinson says: "After eighteen years' of faithful service, I do not wish my old horse to fall into unkind hands, but if he were to die I would never buy another, but would use two automobiles. I have never had an accident with the Rambler, and have never been towed in, and the car has always gone on its own power, although the first thing I did with my car was to make a 2,000-mile trip. I expect it to run as well for two seasons more."

Doubtless the class of information that physicians who are intending purchasers of automobiles are most anxious to gain is that concerning the actual cost of keeping and running a car. This subject is pretty well covered, as may be seen from the following taken from the contribution of Dr. Alexander Nettelroth, Louisville, Ky: "I have calculated my mileage from figures based on the first 5,280 miles (then the odometer was broken and not replaced). I used 241 gallons of gasoline; this gives an average of 22 miles to the gallon, and has since been verified over known distances and is accurate; hence, I can fairly estimate my mileage on a total of 800 gallons consumed to the first of this year as about 17,600, which cost me \$746.73 over a period of five years. An accident contributed a heavy repair item to this bill, there being no expense for repairs in the fifth year."

A STUDY OF THE MICHIGAN FACTORY SYSTEMS

By BERNE NADALL.

DETROIT, May 11.—With an ample equipment of modern machine tools, a good many of them of special design, 2,000 skilled mechanics, housed in a spacious, well-ventilated and light factory of hygienic construction, and an organization of unusual merit, the Packard company of Detroit stands foremost as one of America's leading scientific institutions. Everybody knows the Packard car, so we will deal mostly with the concern that makes it.

To know of the workings of the organization is to gain knowledge as to how well the work is done. The first impression of the plant was gained by the handsome entrance and a stroll through the spacious hall which leads to the various offices. The arrangement of these is in itself a study, as each office has outside light. This scheme is applied throughout the works and naturally all hands are working under the best conditions at all times, both socially and hygienically. An illustration of the correspondence room shows a busy force employed. No office

tracings are cared for in the same manner that the banker safeguards his money and the most precious of his documents. They are as carefully guarded against loss by theft or fire as the most valuable papers possibly could be, and a most complete record is kept of every one, showing exactly where it can be found without a moment's delay.

Going into the factory one finds a clean shop. By clean is meant such cleanliness as one would find in an office. The whole institution is one of newness and comfort—even the wood-working department is free from dust or grime, and also that awful clatter which usually attends a visit to a wood-working plant. It is impossible to show a view of this and several other departments, for some of them never have been photographed. It would be well worth showing the wood-working department as an example of what can be done in a factory by way of benefiting the conditions of the men. The new engine house also is incomplete, but of equally fine proportions.



A Glimpse of One Corner of the Completely Equipped Testing Room of the Packard Plant.

contains a stenographer and no typewriter mars the quietude of the various official sanctums, which is an innovation that must be tried to be appreciated. No better summing up of the situation can be made than is illustrated by this trend, shown all through the institution—the minute study of every part and every condition. In an illustration of the physical laboratory, which is in line with the row of offices, but just as quiet a place to be in, it will be observed that a spring is shown undergoing a test. No part of the Packard car leaves the works without first passing some official inspection; by that is meant that every part must be recorded and hall-marked by the proper official, who does nothing else.

Next to this department is the chemical laboratory, where experts are continually analyzing the ingredients which go to make up the metal formulas, or to test such products as the company might purchase from other concerns or countries, as no new invention which is of interest to the motoring world is ever turned down by the company without at least an investigation as to its merits. The draughting department is as large as the stenographic staff; in fact the photograph herewith shows only about one-half the staff at work. Original drawings and

Of the many departments which go to make up this huge concern, the visitor is impressed by the scrap department, which occupies the large space of 5 square feet. It was with pride that the guide showed the scrap pile. One would think, because of the great amount of testing going on, that a big scrap pile would accumulate, but it is said to be quite the reverse. The fact that everything must pass a certain test makes the men exceedingly-careful, and by keeping each man up to the mark he makes a better workman; in fact he always is improving rather than retrograding. This goes to show that quality need not necessarily mean waste.

On and on through the spacious buildings we went—a never-ending, instructive trip. At one point incomplete engines galore were found, running with dummy cylinders; at another the engines were running under their own power. A continuous chain of systematic shifting always was taking place as the work progressed, and not one moment was lost in the operation. It was particularly interesting to note the manner of checking the work as it went through the factory. A tally card is attached to every job that goes through. These cards are numbered and recorded and at any time one can trace where the job is. By



The Packard Visitors' Reception Room.

the time the card leaves the machine shop it has a whole motor car attached to it, but even then its course is a long way from the end. Each department through which it goes records the work done and also checks off by punch mark every article that has been supplied to it by the other departments.

Where and How the Rapid Is Built.

A visit to Pontiac, Mich., takes one to another concern which has made an exhaustive study of system in the shop. The Rapid truck is well known in many countries. Up to the present time no fewer than sixteen countries are using these commercial and sight-seeing cars, and the business is increasing all the time. Much of the success of this company is due to the manner in which the business is handled, both commercially and in the factory. It is not altogether plain to the outsider that it is more essential to have a good working system in the factory where commercial rigs are manufactured than in the pleasure car shop, but a little reflection brings to one's mind that a few days' delay in the delivery of a car or even a part in the case of the pleasure vehicle may not matter, but a 24-hour delay in the delivery of a part for a commercial truck will cause a running fire of complaint. Let one truck doing duty for a concern cease working for a day only and the condemnation knows no end, hence the manufacturer who wishes to keep in business must have his institution running in chain fashion all the time. The



Part of the Packard Well Lighted Draughting Room.

Rapid people seem to have mastered the case well, and it is the only place visited where two store rooms are utilized to keep abreast of the wants of both the factory and the user. Every want received by mail or wire is on its way to the customer within an hour's time after the receipt of the requisition. The same painstaking care exists throughout the shop, and such allotments for work going through as may be required are anticipated by records of the progress of the work, and the material is found in readiness, waiting for the order of the shop foreman.

This system of working not only saves delay in supplying wants rapidly, but also assists in the purchase of new to replace depleted material. The two-store idea certainly is a good one, one being used for raw material and the other for finished parts. In each crib is a card which can be seen at any time, which shows just what has been taken and what time the replenishing order went through. When the new material comes in it is likewise noted and with a regularity that spells systematic application of good shop practice. Two sizes of chassis are turned out by this company, and there never is any confusion of orders, it is said, and no instance has been recorded where there has been a mix-up of orders. Besides the two sizes of chassis there are some four or five models or patterns of bodies fitted, making the work somewhat complex when it is known that sometimes 500 cars are put through at a time or within a season of a few months. In a shop where a good system was an unknown quantity such a proceeding would be impossible and chaos would reign.

To give one an idea of what a factory must stand in the way of bad treatment of cars it is said that while the largest Rapid truck was rated to carry 1 1-2 tons, it frequently was found that as much as 3 tons were carried regularly. Not only are the trucks overloaded, but when in the hands of careless drivers speed is unnecessarily fast. Such a thing as nursing an engine, which is already strained by overload, is seldom done, the reverse being the case nine times out of ten. Thus it will be seen how well it must be made to stand everyday usage under present conditions. As time wears on, naturally things will shape themselves and the truck user will learn that a good motor truck always has been a far better proposition than he supposed it to be. In the Rapid chrome nickel steel enters into the construction. An illustration of the Rapid chassis, onto which are built hotel buses, police patrols, ambulances, wagonettes, sight-seeing cars and trucks of every design, appears.

In the chassis illustration will be seen the spring suspension which is somewhat novel. The platform pattern is adhered to but supplementary springs are used as well, being placed over the axle in the case of the rear one and under the seat position in front. In each case these supplementary springs are placed crosswise and alleviate any listing that would occur from overloading at one or the other side without the supplementary springs.

Each piece or screw of this chassis has a number, name and code word by which it may be ordered, which helps to make the perfect system referred to above. Also illustrated is the jackshaft construction, which is good. Usually a jackshaft on a truck is a more or less neglected part—a sort of go-between which becomes neglected in the same manner as the chains, finally giving trouble. The Rapid jackshaft is a nice piece of work and is in keeping with the rest of the car. Timken bearings are set in the ends of the seamless steel tubing, all of which is supported and aligned with a perfectly braced sprocket.

The same inspection is given to such parts as is received by the engines or other more important essentials. Another novel point is the manner in which the valves are set, being both air and water-cooled. The illustration shows a sectional view of the valve pocket, the part A being the point where the valve seats and B the stem groove, the design forming a simple water-air surrounded arrangement and accessible. Part C shows how the valve can be taken out. The valves are mechanical and the intake port permits the gas to enter and be drawn in to the cylinder without a great amount of vacuum or eddies. The manner of taking the valve casing out is also good, the illustration

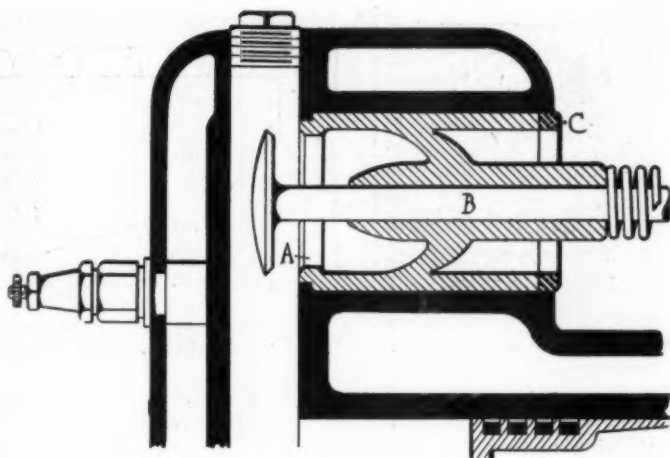
showing the two pieces, the inner piece, when released, sliding out in a manner similar to the French pocketed valves, which usually are fitted into the head of the vertical four-cylinder engines.

Pointers in the Design of the Oakland.

Among the new cars of the last year or so may be named the Oakland, another of the products of the busy brain of Alanson Brush of Cadillac fame. This car, like others which have been designed by Brush, is full of novelties. The engine particularly is interesting. In the first case it is a two-cylinder vertical motor of the usual French type. The Oakland motor, besides being a two-cylinder vertical engine, also is a vibrationless two-cylinder affair. When the two-cylinder vertical idea is broached to an engineer in this country he at once nails your argument by the claim that the two-cylinder horizontal is better.

In the Oakland product there is a set of balance weights theoretically worked out in a manner to produce a compensating action for both the vibration and the explosion torque. The means of procuring this is novel in the fact that it is simple and adds but little extra expense for the increased advantages. In the illustration a view of the complete engine is shown with explanation of each part. By noting this closely it will be seen that gearing is the means of accomplishing the action of the counter weights, A and B, by the revolutions of the engine shaft. To the left will be seen the driving mechanism of the valves and to the right is shown the ball-bearing balance weights, A and B. These weights are placed on an eccentric shaft to procure variations in setting, as it is very essential to get the compensating balance weights perfectly adjusted in the beginning. It will be observed that the crankshaft weight can balance only one thing and that is explosion torque, the vibration occurring presumably immediately after the explosion. If this is the case—and we know that the vibration of a vertical internal combustion engine is in a lateral direction—then there are times in the revolution of the crank that the weights are accomplishing little; that is, at one moment they produce a great resisting element and gradually cease to have retarding action the further the crank turns away from the point where the explosion occurs. Naturally, these weights are revolved by the turning of the crankshaft, to which are attached the usual balance weights, designed in this case, however, with special reference to the action of the counterbalancing device, which is what serves to make the Oakland motor one of the quietest running of its type.

Now this fact is apparent in all two-cylinder vertical mo-

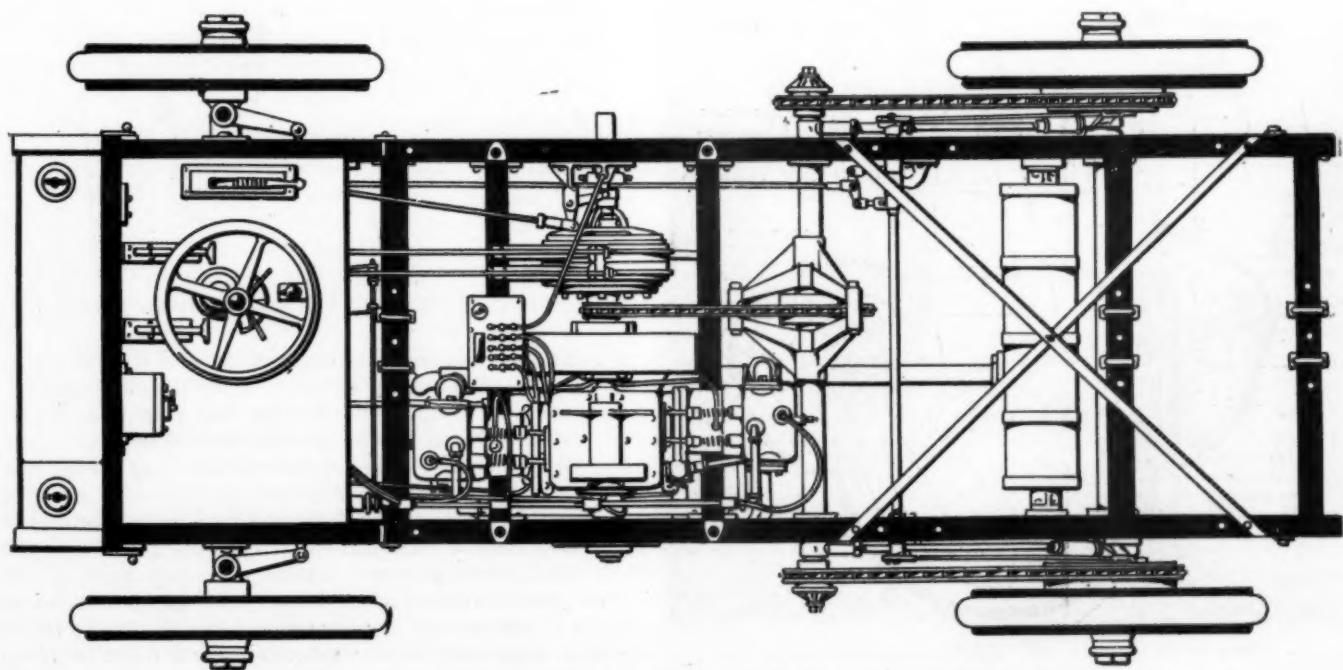


Design of the Valve Pocket of the Rapid.

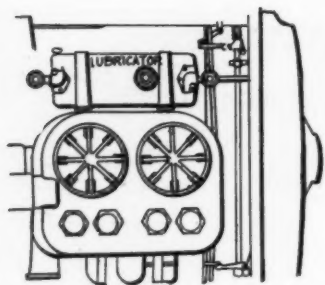
tors and would be observed in the Oakland but for the counterweights, A and B, which come into action when they are wanted; namely, when the vibration sets in. It is plain that a large percentage of the vibration of the two-cylinder verticle engine has been done away with. One demonstration which was made was that of placing a lead pencil, point upwards, on the top of the cylinder and running the engine at something under 500 revolutions per minute without vibrating the pencil off the cylinder.

Another point is the apparent extra power shown. While the horsepower formula, such as adopted by the A. L. A. M., would show 8 horsepower—the two-cylinders producing 16 horsepower—it is a fact that the Oakland engine seemed to do better work on the road. There seems to be greater activity under all conditions than on any similar car; the pick-up is very noticeable, and with the engine running low the acceleration is quick on hills, considering the load that was being pulled. It appeared that reducing the vibration brought about a freer engine action.

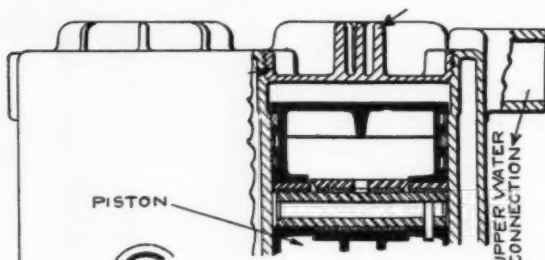
The transmission is another novel feature. It has two speeds forward and one reverse, and is attached to the driveshaft under the front seat. It is a planetary gearset, but instead of brake bands it has clutches which run in oil carried in the aluminum case. The claim made is that in the ordinary planetary there is always a drag which is entirely overcome by this new clutch principle. The illustration shows the design of the casing E.



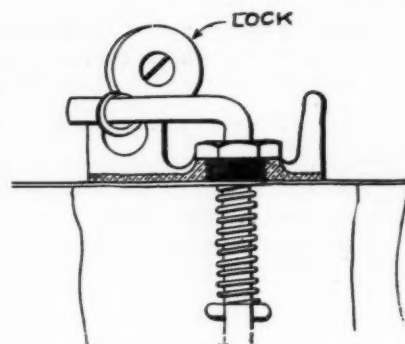
Plan View of the Two-cylinder Horizontal Engine Rapid Commercial Chassis.



Plan View of the Oakland Motor.



Part Section View Showing Cooling Flanges.



Oakland Gasoline Tank Lock.

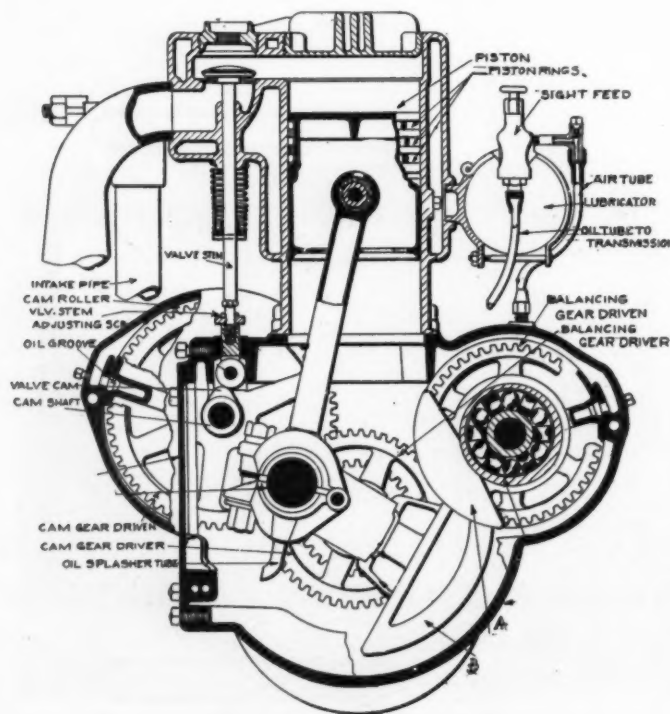
with one side cut away. The part A is the clutch ring shifting arm, that marked B the high speed clutch lever shaft, and C is the slow and reverse clutch ring. The high speed clutch D is a multiple-disc affair and is self-locking, the speed being thrown in by the side lever and separate from the others. The low speed and reverse are manipulated by the pedal, and the ease with which these clutches are worked is certainly gratifying. The clutches work longitudinally and are cone-shaped. F are the planetary gears, G thrust bearings and H a universal.

Oakland features are all Brush, and that means that there always is more than one way to do anything. As in the case of the Brush car the head of the cylinders is fitted with a most accessible cap of a diameter larger than that of the piston and set in by a coarse thread which insures it being gas-tight as well as easily removed. An illustration shows this cap, A, and also the valve cap which is beside it. The cooling of the cylinder head cap is procured by fins, F, cast into it. The water-jacketing of the cylinders is well designed and made to take in the full stroke of the piston. The oiling system also has some unique points in that oil grooves are used to deliver the oil to the proper places and in the case of the transmission an outside lead is fitted to the tank which leads to the transmission casing. The lubricator is set close to the cylinders to insure proper feeding in cold weather. On the gasoline tank is fitted a lock which prevents any tampering with the car in garages and such places, a commendable arrangement. It is these little refinements which the autoist appreciates in these days of the successful car. It is

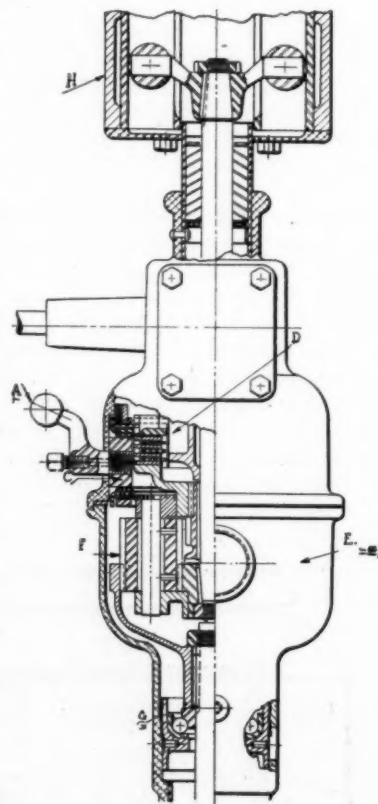
said that a big market is expected in the near future in the taxicab line for this little car—a use for which it is admirably suited. Maximum economy of maintenance in constant service of the strenuous order called for by this usage is claimed by the makers, and when the car and its possibilities are better known, it is expected these claims will be found to be amply borne out.

Ford Has a Great Deal Up His Sleeve.

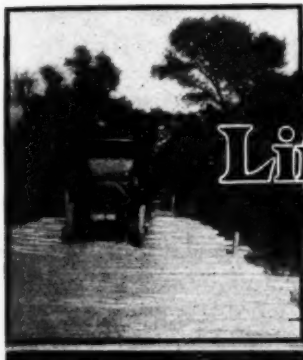
Calling at the Ford plant the writer found numerous new ideas being worked up, but as Mr. Ford was not as yet ready to have anything published the Ford secrets remained secrets. However it was noted that at this place there was no sign of a slump. The very morning the writer arrived, at 10:30, orders to the number of seventy-three had already been received for the little runabouts. On the second morning he was told also of an order for 100 cars arriving from England. Three-point suspension still reigns supreme here, and some of the new machinery which the company has been installing the past winter was shown. It was apparent that a great amount of money was being spent by this concern and that it now is a fact that vanadium steel is entering into the construction of Ford models—old and new—to a very great extent. Eight ovens were already placed for heat-treated vanadium and four large hammers were available for quick working. Most of the new machinery was especially designed, and the designs are the sole property of the Ford company. From the appearance of the place it was evident that the Ford was soon to spring another sensation on the public, but just when that will be, probably only Henry Ford himself knows, and that means there will be nothing known about it until Mr. Ford is good and ready, which will be when everything is ripe and not before, for it has always been a Ford plan not to make any public announcements until everything was in readiness to back them up. No one who has not visited a representative automobile factory can conceive of the amount of preparatory work that is involved in placing a new model on the market, where it is to be turned out in numbers.



Sectional Elevation of the Oakland Motor.



Oakland Planetary Gear Set.



How a Big Red Car Linked the East with the West

By Roger W. Power



THIS story is the record of being so sandy that we had to drop into the intermediate gear and could not accomplish more than 107 miles for the day. To South Bend, Ind., the same conditions continued, necessitating further use of the intermediate. We pushed ahead and reached Valparaiso that night.

Along the banks of the Kankakee river, near the border line of Indiana and Illinois, there is some magnificent scenery, the road leading for about three miles through a vast forest lying in a swamp formed by the overflow of the Kankakee. The path cut through the wood allows the passage of only one team at a time, so that we were compelled to hurry through, blowing our horn all the time. Here and there among the massive trees strung together with festoons of vines would be found an open spot where the water would be lower and a small island of green would be formed. All this, mingled with the song of the birds, made it a spot at which we would gladly have lingered.

After bad roads from Effner to Watseka, Ill., where we passed the night, we pulled out, and at Gilman picked up the trail of a Thomas Flyer, which we followed to Forrest, obtaining a better road than the one we had going east. Running between Chenoa and El Paso, a big farm team loaded with people going to church came towards us. When almost opposite, the two horses shied, there was a mix-up which resulted in a broken strap and gave a slight scare to the ladies of the party. The payment of \$1.50 made everybody happy, and we proceeded on our way, only to be stopped a little later by a puncture, which we righted on the schedule time of fifteen minutes. When we ran into Peoria again our total expenditure for repairs, excluding the compensation for broken strap, was five cents.

We were fully loaded up for a 5,000-mile tour when we pulled away from the National Hotel, Peoria, Ill., our united weight, with passengers, trunk, four grips, and extra tool box, tipping 4,350 pounds. A bolt sheared off one of the front springs before we had passed out of the State. We discovered it while lunching under a delightful canopy of green, finished our meal in true picnic style, pushed on to Fairbury, and had the defective piece of metal replaced at a cost of five cents. This proved to be the only outlay we had to make for repairs on the entire journey. We ran out of gasoline when three miles from town, strayed from the right road when near the border line, and had to suffer axle deep mud as a consequence, and finally were responsible for the death of one of Michigan's big white roosters. But as it was impossible to shift the responsibility for any of these adventures, we were well satisfied with the way in which our Glide had carried us to the deck of the Eastern States, bound from Detroit to Buffalo.

All Well Aboard, Bound for Far West.

A brief visit to Mormon Hill and other points of interest, and at high noon on August 2 we "gasolined" out of Palmyra, N. Y., for the far West, all well on board. Batavia housed us that night, and Buffalo and the Falls had our company for the next twenty-four hours. Our first puncture came just after a stop at the Falls to have a tire vulcanized, and was caused by a thin wire nail pricking a hole through the casing. It required some navigating sense to get through Buffalo with its maze of cross cutting but as soon as the shore road was struck complications ceased and fine roads were our lot. Three hours out of Erie the expert was dissatisfied with the way in which the carbureter was attending to business and ordered a stop which proved to be of short duration and did not prevent us reaching Erie for dinner. Some of the hills west of Erie were sufficiently formidable to tackle the full power of the car and though the roads were good we had to slip into the low gear and literally crawl to the top. Going down it was necessary to lock the brakes. After lunch at Conneaut, a pretty little town with a hotel that holds out a real welcome to automobilists, we replaced a tube on the right-hand rear wheel in exactly fifteen minutes. By 6 o'clock we were rolling over the smooth surface of Euclid avenue into Cleveland, and at nightfall were on board the *St. Ignace*, bound for Detroit.

The changes which we made in our western route to Peoria did not bring with them improved roads, the going through the picturesque country from Clinton to Coldwater

Starting Out for Adventures in the West.

After the car had been looked over at the factory, we proceeded westward in a cloud of dust caused by a big six-cylinder ahead of us. We stood it for half an hour, then dropped into the rear to get a little breath, putting on a spurt soon after and passing the six.

There was some real excitement late in the evening when running from Macomb to Carthage. The night was dark and the road a difficult one to follow, our only direction being to keep the main traveled road, and we "couldn't miss it." We thought we followed out the simple rule of conduct, but something must have been amiss, for we suddenly found ourselves in the farmer's back yard, where our brilliant headlights caused a terrible scare among the women folk. Either the farmer's powers of explanation were weak or our comprehension was dull, for after a long talk we had made so little progress that we asked the farmer to go with us, promising him a good automobile ride and a journey home on the cars. He thought it over for a while, then said he guessed he would do it and luckily for us he did, otherwise we would have had to camp out somewhere in the woods. When we pulled into Carthage it was 11 P.M., all of us dead tired and glad to turn in for the night. Before we got into Burlington, Ia., the next night, and covered 2,000 miles, we had a little trouble getting on the old river boat *Eloise*, which carried us across the Mississippi to a well-earned rest that all of us were mighty glad to avail ourselves of, as a day's drive makes one ready for bed.

As the real pioneer work was expected west of Omaha, Neb., we spent a day in that town making preparations. The commencement was good, for, although there were hills out of Omaha, the road was macadamized and paved with brick, so that we could bowl along in fine style without any interruption. After Fremont, we dropped into a lot of quicksand and only pulled out after throwing sunflowers and bits of boards under the wheels. After Schuyler, where an excellent hotel provided an excellent lunch, we struck a perfect, hard, level road which allowed a speed of 25 to 30 miles an hour, and enabled us to run up a total of 166 miles when we put into Grand Island for the night.



As we ran further into Nebraska the country changed, the little streams and the groups of green bushes, which were so plentiful in Iowa, giving way to a vast expanse of level and dry country as far as the eye could see, often decorated with golden sunflowers for miles and miles. Along the banks of the North Platte river as far as North Platte City the road was hard and smooth, reminding us forcibly of the Lake Shore drive along the south side of Lake Erie. Not until we had passed Sutherland did we get our first experience with a Nebraska sand-draw, causing long and wearisome labor, which might have been avoided by crossing the South Platte river at Paxton and taking the road on the opposite side.

At Julesburg, Col., we took a guide who showed us a way over the hills which gave a shorter and better route than the one by the railroad. At Chappel, Neb., our guide left us and we continued alone to Sidney, stayed there all night, and next day ran to Cheyenne, Wyo., over fine hilly roads.

Magnificent Automobiling on the Heights of the Rockies.

It was from Cheyenne that the real hill climbing began, our morning run to Laramie, only 67 miles away, giving us a climb of 8,100 feet to the top of Sherman Hill, the highest point in the Rocky mountains. It was a magnificent climb, over a roadway that is a boulevard of disintegrated granite, allowing us to skim along at a speed of 25 miles an hour for the entire distance. As if to crown the beauty of the ride, from the top of the hill by the side of Oakes Ames monument, a fascinating view is obtained which embraces mountain range upon mountain range, each rolling away in the distance like mighty billows of blue. With regret we left the spot and began to wind down through the canyons and gulches of the mountain side with never a bump or jar to mar the pleasure of gliding through the cool mountain air.

We considered it advisable at Laramie to enlist the ser-

vices of E. A. Buck, a civil engineer, to guide us through the little-known and often dangerous mountain wildernesses. On the Laramie plains some Denver tourists advised us not to attempt to reach Saratoga by the Rattle Snake Canyon route, a cloudburst having rendered the road impassable. Our guide concluded, although unfamiliar with the route, that it would be better to attempt to cross the divide by what is known as Pass Creek, and changed our line of march accordingly. A couple of large Packard cars, bound for the town of Hanna, followed us until they both became mired in a swamp which we had had the luck or the wisdom to avoid. Further on we had our difficulties in the shape of roads filled with rocks and furrowed to a depth of 18 to 20 inches, but they were all overcome by a responsive engine and enthusiastic workers.

By 3 o'clock in the afternoon we had reached the Medicine Bow Junction, crossed the river bearing the same name, turned south and wound round the side of the Elk mountain in Wyoming, to Pass Creek divide. After two hours' plodding the trail had faded away in the mountain grass, and we were compelled to turn back seven miles to a ranch house to



learn where we were. It appeared that we had not been following the trail to Pass Creek at all, but that a road which turned sharp to the right at the ranch house was the right one. "It's a terribly rough road," vouchsafed our informant, which was not at all pleasant news for us, for on our seven-mile return journey we had had the misfortune to puncture our reserve gasoline tank and lose all fuel but that in the ordinary tank. Though it was 6 o'clock, we decided to push on, get over the divide, five miles away, pass down the other side, and reach Saratoga that night.

How Nature Was Victorious in an Unequal Struggle.

Darkness came upon us as we climbed up the almost impassable mountainside, and wound round chasms through which the water rushed hundreds of feet below. Finally, even a racing engine and the low gear were insufficient to the task, and we could only make progress by getting out and giving external aid. At 9 o'clock at night, high up in the darkness, with only the company of the quaking asps, an examination was made of the road ahead and the resolution arrived at to abandon the attempt. We felt like deserters as we left the faithful car high up on the plateau, 9,000 feet above sea-level, and started to trudge the three and a half miles to



the rancher's house. We were received with a hospitality that is worthy of more than a mere passing mention. When Mr. Nelson, the rancher, learned that we had left our car up near the divide, he told us he owned a wild bull, who reigned supreme in that vicinity, and who would certainly destroy the red car if he and his family discovered it in the morning. In consequence our driver, Harry Russ, went back with the rancher and brought the car down the steep declivity, reaching the house at 2 o'clock in the morning. There were five pairs of staring eyes, and five busy tongues when the children came out next morning and found a big red automobile in their yard, the first that had ever been in their vicinity.

With three gallons of gasoline in our tank and no possibility of obtaining more, and the assurance of the rancher Steele, then across the Platte river as best we could. At that it was impossible to go down the Saratoga side of the hill, on account of the sharp turns, rocks and precipices that would be encountered, we felt, to use a colloquialism, "up against it." Our best plan appeared to go back to Fort Medicine Bow, but a man with a moving-picture show had forestalled us and taken every drop of gasoline the place possessed. But there was a telephone which enabled us to get Hanna for ten gallons to meet us on the road.

As we saw with our own eyes, the bridge over the North Platte had been swept away, the only means of crossing being by the railroad bridge. There being no alternative, we ran our car a mile down the track, rushed it up the embankment, and crossed the bridge 60 feet above the water, on the railroad ties. It was a thrilling experience, for behind us was a big, impatient freight train.

From Fort Steele to Rawlins, and from Rawlins over the Red Desert to Creston, there was not much fault to be found with the road. But when we began to climb down the grade to Bitter Creek and wound along by that famous stream, through its gullies and washouts, we discovered that the difficulties of the preceding days were but a prelude to greater trouble. With tire chains on and the engine devel-

oping its full power, it was impossible to get through the heavy sand without the use of the shovel. Two miles out of Hallville we had a puncture; two miles further on we had a blowout; half an hour later there was another blowout. So we were delayed, while Rock Springs, the only town which could offer any accommodation, appeared an interminable distance ahead. After numerous escapes from toppling off the washedout road into the creek, we finally reached the town, tired enough to hope that the next day would be easier.

P. W. Spaulding, an enthusiastic autoist and a lawyer, of Evanston, Wyo., met us at Green River and proposed to guide us to his home town. He reported that the Black Fork river was high, and that it would be dangerous to attempt to ford it, but believed that we could cross the railroad at Bryan, and by traveling to the north of Granger over an old trail, reach there without doubt that evening. We followed the old trail, but did not reach Granger. At 9 o'clock at night we were stopped by a gully about 50 feet deep with 18 inches of water and sand at the bottom, and with sides so steep that no vehicle could get down, or if it did, could not possibly get out again. There was nothing for it but to stay there all night. Some of us slept on the ground, or tried to, and others made themselves snug in the automobile. After a night spent listening to the coyotes and watching the rising of the moon, we were on foot with the first twitter of the birds, scouting about for a way to cross the gulch. None was to be found, so we returned to Bryan, loaded our automobile on a flatcar and ran across the Black Fork river, after which we unloaded, ran the car through Echo Canyon to Ogden, and then on to Salt Lake City and home.

Our journey had given us a record of 3,626 miles, over roads or no roads that sometimes necessitated the use of block and tackle, but never developed a defect or a weakness in the car. To-day it is running in as perfect condition as when it left the shop in Peoria, and has the honor of being the largest touring car which has ever crossed the Rocky Mountains on the overland trail.

PLANNING FOR BIG MEXICAN ROAD RACE THIS FALL

MEXICO CITY, May 8.—According to J. L. Lawrence, who won the Jalisco cup last year on a 30-horsepower Pope-Hartford, plans are already under way for the holding of the race for the same trophy on a new course to be built at Guadalajara. The race was to have been held last month, but it has been postponed to November next, in order that complete preparations may be made. The work of preparing a racing circuit is in the hands of the Jalisco Automobile Club, and the plans already drawn up provide for a course that will be the best in the Republic for making fast time. It will be graded to an average width of 18 meters, while the curves will be widened and eased off so that better speed will be possible on the turns. Its length is to be increased from 35 to 40 kilometers, and, at the same time, the two railway grade crossings that were a dangerous feature of last year's course, will be eliminated. Numerous general changes in the course will also be made to improve it, and as the natural formation does away with the necessity of using any top dressing, a liberal grading and rolling will make as fine a surface as is to be found anywhere.

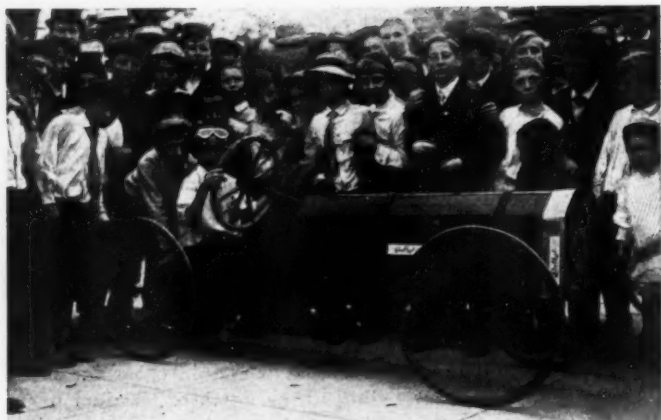
It is anticipated that the special committee of the club which has the Guadalajara meet in charge, will spread the program out to cover a week, which will be inaugurated by an endurance run, or touring-car race to Guadalajara from Mexico City. This is scheduled to start on November 5. Several touring car owners have announced their intention of entering for the trip, which will doubtless be a real endurance run, as there are all kinds of roads between here and Guadalajara. No trouble is expected in arranging a program of interesting events that will take up

the entire week, as practically every autoist in the republic will be there, and the attendance is expected to reach fully 10,000 people. There will be motor boat races on Lake Chapala.

Since receiving assurances that there will be no hitch in the arrangements for holding the Jalisco Cup race, there has been a noticeable revival of interest on the part of intending entrants. The Sanchez Juarez Company, of Mexico City, has announced that it will enter two machines, a 120-horsepower Spa and a Renault of the same power. The Compañía Mexicana de Vehículos Electricos has stated its intention of entering a 60-horsepower Locomobile, a 90-horsepower Mercedes and a 120-horsepower Dietrich, beside which there will be a 90-horsepower Brasier, entered by Juan Cobo. J. L. Lawrence, the winner of last year's race, is slated to drive the Mercedes.

Mexican Auto Club Has House Warming.

Elaborate preparations were made for the formal opening of the new clubhouse of the Automobile Club of Mexico on Thursday, April 23, and the event was a great success. The new building is beautifully situated in Chapultepec Park, on the bank of the lake, and is completely fitted up for the comfort of the members, as well as the accommodation of their cars, the garage being in a separate building at the rear. The club now numbers about eighty members, but there is now a long waiting list, and it is expected that many new recruits will be added in view of the club's move into its new headquarters. The officers are: President, Fernando Pimentel y Fagoaga; vice-president, Rafael Bernal; secretary, José Hilario Elguero; treasurer, Javier Algara.



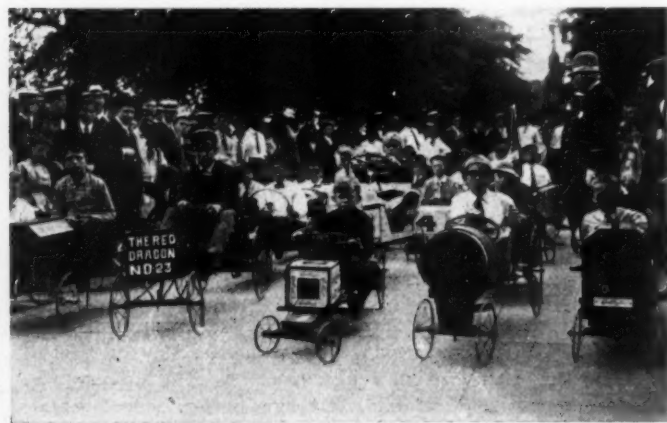
The "Acme Gearless" in Readiness for the Push-off.

YOUNG SAVANNAHANS HAVE "AUTO" RACES.

SAVANNAH, GA., May 9.—The youths of Savannah are certainly very much interested in automobile competition. Recently a series of pushmobile races were established, the first of which took place Saturday, April 25. There were 25 starters in the first event, Secretary A. W. Solomon, of the Savannah Automobile Club, sending them away on their ten-lap journey around the Confederate monument in Forsythe Park. The winner was Herbert Miller, whose three pushing mechanics apparently had more windpower than any other trio. Each contestant was allowed three mechanics or assistants, and it was a case of steering and pushing. The police patrolled the course, and while there were a few skinned knees and considerable torn clothing, there were no fatalities to mar the successful event.

For the May 2 race, J. E. Finney, the Acme agent, offered a handsome cup, to become the property of the driver who wins it three times. Edward Pacetti Jones, who raced under his foreign sounding intermediate title, and whose car bore the significant "No. 23," not only had the coveted honor of bearing away the Acme silver trophy, but received an enlarged photo of himself and his team of power plants, a baseball mit and \$3 in cash. No racing driver ever had half the glory that this winner of the southern "Vanderbilt junior" received when he was tossed on the shoulders of the crowd that cheered him. In the great race, which was the third event, the Jonesless driver brought "23" over the tape a full hundred feet ahead of No. 33, with Malone at the wheel, while McLeod, No. 20, came home third.

Nearly 60 machines were entered, and the send-off of the first race presented a confused maze of white streamers and goggles, lost beneath a wave of shouts that showed some of the motors to be wasting their windpower on other things than propulsion. "Prohibition" and "Red Devil" took the lead abreast and kept together for some time, but the devil won out in the end. According to one of the motors, "We do the work and



Line-up for the Hair Raising Contest—No. 23 Winner.

the driver just drives," but it took no little skill to pilot a car through the maze of fifty odd machines on a narrow course. "Death turn," just southwest of the monument, caused many a spill, and the daring driver who showed great skill there was christened the "big wiggle." The officials included Mayor Tiedeman and President Battey, of the automobile club.

Another race is scheduled for May 16, for which John E. Finney has donated a challenge cup, to be won three times before it becomes the property of victorious driver.

SAVANNAH CHALLENGE CUP READY TO AWARD.

SAVANNAH, GA., May 9.—The Savannah Challenge trophy, won by Strang in the Isotta in March, has now been completed, and as soon as it can be suitably engraved, will be forwarded to New York, to be awarded to the winner. The accompanying photograph is the first that has been taken of the new trophy, and shows it to be a handsome specimen of the silver worker's art. The center panel, which dominates the decorative scheme, is

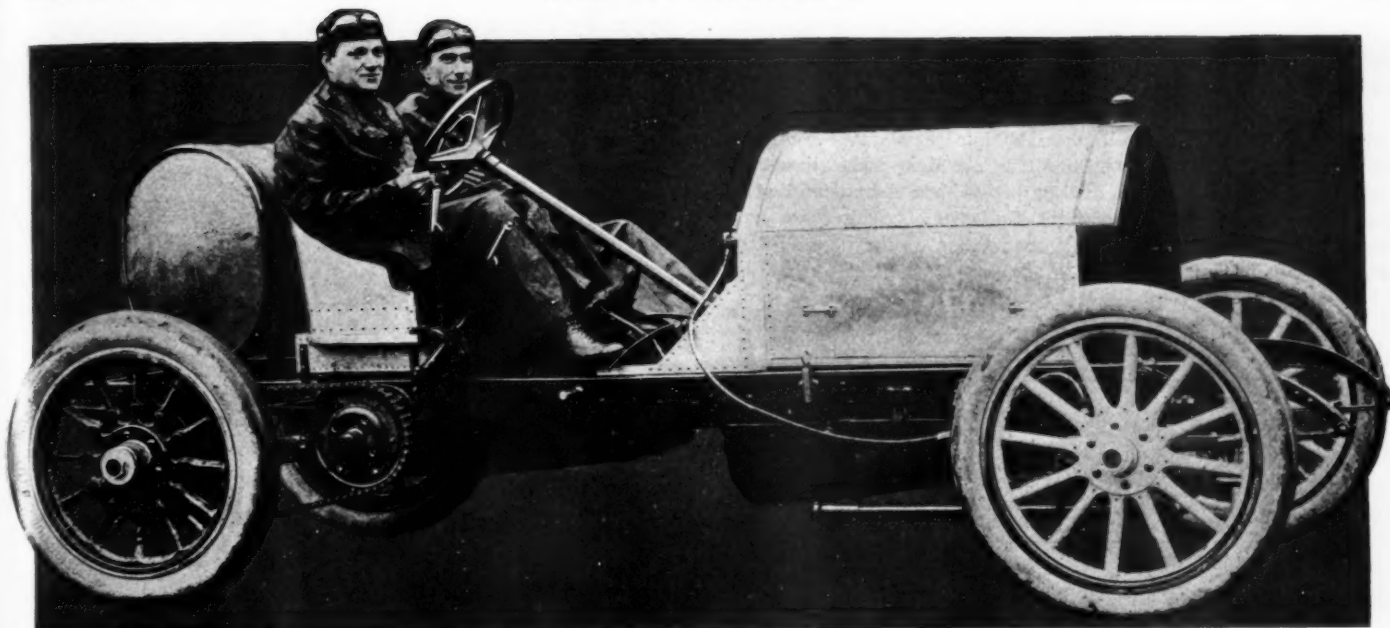


Handsome Savannah Challenge Cup Won by Strang.

occupied by a half-figure of General Ogelthorpe in high relief, while the ornaments are all suggestive of Georgia scenery, such as the palmetto, Spanish moss, and cotton. Round the nine-inch ebony base are plates representing cotton bales, designed to be engraved with inscriptions concerning the race, a new plate being used for this purpose each year. The cup stands twenty-seven inches high, and makes a most appropriate trophy.

NEW YORK STATE HIGHWAY WORK.

Since 1898 the State of New York has completed 978 miles of improved highways at State, county and town expense. The State now has 1,034 miles of roads under contract and 977 miles of roads waiting the letting of contracts. In 1906, the State appropriated for highway improvement \$5,000,000. In 1907, \$3,000,000, and in 1908 \$3,000,000, making \$1,000,000 available now, and \$2,000,000 available in the fall. The appropriation, therefore, is as large this year as it was last, and it is expected that the increased amount of interest in the good roads movement will be responsible for pushing this work more than in former years.



Thomas Flyer Which Has Been Slightly Changed by Increase of Bore for Grand Prix—Driver Strang and Mechanic Marquise Are Aboard.

AMERICA'S CANDIDATE FOR FRANCE'S GRAND PRIX

MAY 20 a Thomas Flyer will be shipped abroad for a try at the Grand Prix, the blue ribbon of European automobile racing, scheduled to take place over the Dieppe circuit on July 8. Louis Strang, with John B. Marquise as his mechanic, will go as the car's crew. Harry S. Houpt, whose enthusiasm, enterprise and liberality have in the past contributed so largely to Thomas racing prestige, will accompany them as manager, mentor and trainer.

When E. R. Thomas, with characteristic enthusiasm and patriotism, essayed to make an entry for the Grand Prix, he had in mind the construction of a full team of three special racing cars, so as not to be behind his European rivals in preparedness for the great test. Pressure at the factory, however, in getting out the 1908 models left no time or opportunity for the extra work of designing and constructing a trio of racing machines. Instead of a trio of racers, he will, of necessity, have to pin his chances to a single stock car, whose only variation from the standard model turned out for customers will lie in the bore, being 5-8 of an inch larger than that of the regular stock Thomas Flyers. There has not even been time to satisfactorily try out the present car, which is, of course, far from a racing car, when one compares it with the specially built and long-tested European cars that the Thomas will have to go against.

In securing Strang and Marquise, who manned the victorious Isoffa at Savannah and Briarcliff, and prevailing upon Mr. Houpt to accompany them as manager, Mr. Thomas has shown characteristic forethought. His car will be assured of the best driving and handling that the United States affords. That the attempt will result in more than the Thomas demonstrating the lasting qualities of the best American stock cars under high speed road conditions, Mr. Thomas has little hope, in view of the handicap he has shouldered.

Mr. Houpt a Conscientious and Energetic Sportsman.

Mr. Houpt was the first to give the Thomas a try in an international race. How he put up Montague Roberts in the first Vanderbilt elimination trials and won a place on the team, only to have his car shelved in favor of an arbitrary selection by the committee then in charge, is racing history. Mr. Houpt's attempt, however, was at the bottom of the serious try Mr. Thomas made in 1906 for Vanderbilt Cup honors, when he built at an enormous expense three racing machines and engaged Le Blon and Caillois, two French cracks, to drive two of them, his

return being the beating by Le Blon of all other American cars in the race. The long period of uncertainty as to the completion of the Long Island parkway ending in the abandonment of the Vanderbilt race of 1907 discouraged Mr. Thomas from his purpose to build other cars for another try. Grand Prix rules and restrictions prevent his using the three racing cars on hand.

The Thomas will not enter the race by any means unknown to European followers of automobilism. The beating it gave the French, German and Italian cars across the American continent in the New York-Paris race has given the Thomas an enviable introduction to foreigners. Mr. Thomas hopes that a creditable stock car demonstration in the Grand Prix will confirm the reputation his around-the-world car won. He really can hope for little more.

To-night, at the Hotel Marseilles, New York City, Mr. Houpt is to be the recipient of a dinner given in his honor by the Thomas staff and employees of the metropolitan district.

GRAND PRIX COURSE CLOSED TO RACERS.

PARIS, May 9.—Racing cars have been forbidden access to the Dieppe course since the first day of the month, the penalty for infraction being disqualification in the Grand Prix. The Racing Board of the Automobile Club of France declares that this measure is necessary in order to safeguard the interests of the public and to allow the work of road repairing and tarring to be carried on with greater activity. Knowing that they would be deprived of their practicing ground Grand Prix drivers have been busy on the course, nearly every man engaged in the race having been round during the last few days of April on either fast touring cars or racers of last year's vintage. Very few of the 155-millimeter machines are yet ready, the only ones on the road at the present time being Renault, Panhard, Bayard-Clement, Motobloc, and Benz, this latter being handled by Hemery.

Prices for the boxes at the official grandstand have been fixed at \$90 for first boxes with 9 places, \$60 for the first boxes having six seats, and \$36 for the second row boxes, also with six places. Second row boxes, also with four places, are offered at \$24. Individual places are being sold at \$4 and \$3 each. For the voiturette race on July 6 there is a lower tariff, the reduction being about 25 per cent. Garage charges are fixed at \$1 for the first day and \$2 for the day of the Grand Prix.

Contrary to the usual custom the weighing-in ground will this year be open to the public at a charge of 40 cents per person for the voiturettes and the heavy cars.

The drawing of places for tire, gasoline, and oil stands opposite the grand stands took place by lot last week, the Racing Board holding this much earlier than usual in order that constructors who desired to do so might have grandstand seats opposite their depots. Any later engagements, either for cars or depots only will be given the remainder of the boxes in the order of their engagement.



Callois and One of the 1908 Renault Trió.

BRITAIN ADOPTS LIMITED BORE FOR RACE.

LONDON, May 9.—In place of the fuel consumption race on the Isle of Man, which the Royal Automobile Club of Great Britain considers to have outlived all useful purposes, England will this year have a purely sporting event familiarly known as the "four-inch race." As in the Grand Prix, the essential features of the regulations are maximum bore and minimum weight. The Britishers, however, consider 155 millimeters too great a bore for four-cylinder cars, and are probably right in view of the nature of the course available for the race. Under the formula adopted practically only four-cylinder cars of 4-inch bore will be eligible, the weight being a minimum of 1,600 pounds without driver or mechanic, gasoline, oil, water, spare parts, tires, or tools. The formula reads: "The race is for cars the D²N of whose cylinders shall not exceed 64, equal to the R.A.C. rating of 25.6 horsepower. There must be not less than four working cylinders." D²N equals diameter of cylinders in inches squared and multiplied by the number of cylinders.

Under the Ostend agreement England has the right to conduct an international speed contest on other than the 155-millimeter rules, the understanding being that races for smaller cars could be held, but that no speed test should be held for machines of more than 155-millimeters bore for four cylinders. It is believed that in nearly every case practically stock chassis will be entered in the British race.

Though no course has yet been decided upon, it is almost certain that the race will be held on the Isle of Man sometime in the Fall. Entries, which must not exceed three per firm will be received at the rate of \$175 per car until July 1. Final closing, at increased fee, will be on August 1. With the exception that both dismountable wheels and dismountable rims will be allowed, the regulations governing the race will be similar to those of the Grand Prix. Thus all work must be done by driver and mechanic; there will be two depots for fuel, water, oil, and tires, and the use of oxygen, acetylene, etc., will be prohibited.

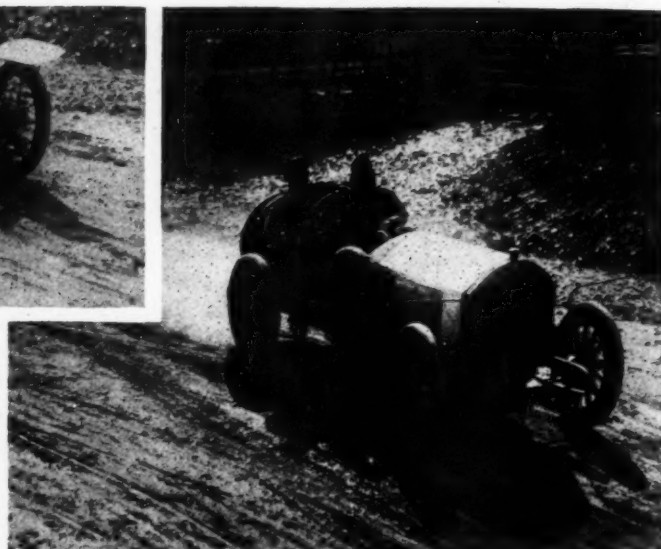
NINE CLASSES FOR JAMAICA STRAIGHTAWAYS.

Announcement has been made of the card for the straight-away time trials to be run at Jamaica, N. Y., on June 5, under the joint auspices of the Subway Celebration Committee and the Long Island Automobile Club. The events are:

- Gasoline stock cars under \$1,250.
- Gasoline stock cars from \$1,251 to \$2,000.
- Gasoline stock cars from \$2,001 to \$3,000.
- Gasoline stock cars from \$3,001 to \$4,000.
- Four-cylinder stock cars over \$4,000.
- Six-cylinder stock cars over \$2,500.
- Free-for-all, all types and motive powers.
- Steam stock cars.
- Stock chassis having 301 to 550 cubic inches piston displacement.

All these classes prevail for the kilometer, mile, and two-mile distances, at which the time trials will be run. Separate entries, however, are required at each distance. The entries will close Monday, June 1, with Fred J. Wagner, assistant secretary, No. 29 West Forty-second street, New York. The entry fee for each car is \$15 for the first and \$5 for each subsequent entry.

Hemery, 1905 Vanderbilt Winner, Now Drives a Benz.

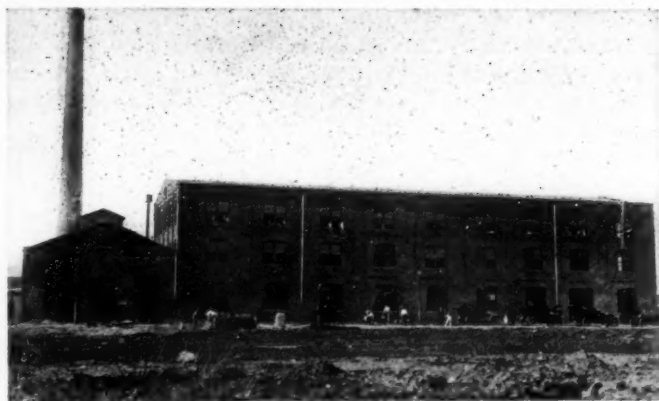


Heath, 1904 Vanderbilt Winner, Still Drives a Panhard.

EVENTS FOR DEAD HORSE HILL CLIMB.

WORCESTER, MASS., May 12.—The hill-climb committee of the Worcester Automobile Club having the arrangements for the third annual Dead Horse Hill climb in charge have decided to have fifteen events, all open to stock cars only. Men are now at work putting the Leicester end of the big hill in shape.

The committee is confident that the record of the hill of 1:01 2-5, made by the Darracq of Samuel B. Stevens, driven by A. L. Campbell, May 25, 1906, will be smashed.



New Factory of the Ajax-Grieb Rubber Co., at Trenton, N. J.

AJAX TIRE PLANT'S HOUSE WARMING.

With Governor Fort, of New Jersey, and Mayor Madden, of Trenton, as sponsors, and two hundred men prominent in the sport and industry as witnesses, the new plant of the Ajax-Grieb Rubber Company, at Trenton, was christened last Monday with due ceremony and much congratulatory jollification. There were speeches, not too many of them, a luncheon, vaudeville, bridge and pinochle tables, and an inspection of the new factory that was most instructive, interesting and impressive. Altogether the entire celebration spoke well for the generosity of the hosts and the confidence of the company in returning business prosperity.

The guests arrived in two special trains, the one from Philadelphia bringing forty Quakers and that from New York a bunch of 149 Knickerbockers. Landed by a private siding at the factory, the visitors were bidden by President Horace DeLisser to climb to the top floor of the main building, where Mr. Grieb was on hand to welcome them. The spacious room was hung with flags and bunting, and at one end a platform was erected. There was a long wait before Mr. Grieb arrived in a Ford, driven by Louis Block, with Mayor Madden, and a still longer one before Mr. DeLisser showed up with Governor J. Franklin Fort in a Maxwell, whose pilot for the occasion was J. D. Maxwell himself. There was a great snapping of cameras. New Jersey's Governor and Trenton's Mayor were loudly cheered as they proceeded to the platform.

President DeLisser began the factory's inaugural ceremonies by declaring that he was never so happy as when entertaining his friends, and that to-day his cup of happiness was running over. He paid a graceful tribute of gratitude to his associates and backers in the enterprise, mentioning by name Benjamin Briscoe, J. D. Maxwell, Henry Ford, James Couzens and William Mitchell Lewis, not forgetting William and Harry Grieb, R. A. Patterson and Alfred Reeves, associate directors, and paying a further compliment to Louis P. Destribats, who designed the factory. In conclusion he thanked Governor Fort and Mayor Madden for assisting at the christening.

Governor Fort made a happy and humorous address. He said he had kissed babies and attended banquets, but this was his first experience at starting what he knew would prove a great industry. He exhorted New Jersey as a State of great achievement and complimented Trenton on being the only State capital that did not have to live off of its Legislature. The starting of this plant gave great promise for the future. Pointing to the Ajax poster, he perpetrated the pun that "though Ajax tires, no one will ever tire of Ajax tires." He hoped the enterprise would prove as prosperous as the girl on the poster was beautiful.

Mayor Madden was brief in his remarks, confining them to the statement that the starting of this new factory at this time was a most encouraging sign of returning prosperity, and the wish that the enterprise might meet with success.

Then Governor Fort pressed electric buttons that set the wheel of the great Curtiss engine revolving and the rollers and grinders to work. Mr. DeLisser concluded the ceremonies by

inviting all hands to go below and see for themselves that the best rubber that could be bought was put in Ajax tires. The invitation was accepted, and the refining, mixing and calendaring processes were viewed with interest.

The new Ajax-Grieb plant consists of three brick buildings, one of three stories, 60 by 190 feet; a one-story press room, 80 by 200, and an engine and boiler room of one story, 40 by 90, giving 53,800 square feet of floor space. The acreage of the factory grounds is eight acres.

The founder of the enterprise was Horace DeLisser, who was formerly sales manager of the International A. & V. Tire Company. The company, which was founded on November 24, 1905, had the backing of the leading makers of the A. M. C. M. A., and fought the then existing tire combination. The first tire was completed January 1, 1906.

The Maxwell-Briscoe Motor Car Company was represented by Benjamin Briscoe, J. D. Maxwell, Frank Dorman and Richard Irwin; the Ford Motor Company by Louis Block, its Philadelphia branch manager, and W. L. Huston, president of the Standard Motor Car Co., of San Francisco.

ASSOCIATED CLUBS ATTACK JERSEY LAW.

NEWARK, N. J., May 11.—At a meeting of the Associated Automobile Clubs of New Jersey, held at the clubrooms of the New Jersey Automobile and Motor Club last week, a committee was appointed, with W. C. Crosby, of Newark, as chairman, to secure counsel and begin proceedings to attack the constitutionality of the amended Freylinghuysen law. The license clause will be the first point attacked, but other provisions of the law may also be brought in question. President George Paddock, of the New Jersey Automobile Trade Association, was present, and assured the State body that the dealers would cooperate with the clubs in the proposed fight, while the latter have provided sufficient funds to secure the best legal talent available.

It is anticipated that George A. Post will resign as president of the associated clubs, as he did not desire the office when elected, and has since declared his intention to resign. In the latter event, W. C. Crosby, now vice-president, will probably succeed him as executive.

SILVER PLATE FOR SECRETARY BONNELL.

NEWARK, N. J., May 12.—A noteworthy incident followed the conclusion of the recent annual meeting of the New Jersey Automobile and Motor Club in the presentation on behalf of the members of a silver service of over one hundred pieces to H. A. Bonnell, the retiring secretary, in recognition of his services during the two years of hustling administration. Orator J. H. Wood called attention to the fact that when Mr. Bonnell took up his office the club had but 375 members, and that its roll now numbered over 800. This is so rapidly growing that before long it is predicted that the club will have over 1,000 names.



President DeLisser Gives Governor Fort a Maxwell Ride.

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RESULTS ONLY THROUGH ORGANIZATION.

That the automobilists of the country will never obtain and retain conditions most satisfactory for the pursuit of their pleasurable necessity, except through thorough organization—locally, by States, and nationally—is plain.

One of the best organized State associations of the A. A. A. is the Pennsylvania Motor Federation, of which Robert P. Hooper is the enthusiastic president and Paul C. Wolff a most conscientious secretary. Its monthly pronouncement always contains much that strikes the mark exactly. We quote from the May bulletin:

The Federation was organized for two purposes: that it should be a State good roads association, and that there should be a body of motorists strong enough to secure the enactment of fair laws regulating automobiling, or to defeat any unjust or oppressive legislation that might be introduced.

We believe that the State associations should maintain a national body for the same reason that the clubs and individual motorists should support a State organization.

It has always been the experience of most organizers that the many prefer to allow the few to do the work. Gradually the present national association is adding to its State bodies, which in turn are gaining club after club, and the day is not far distant when two-thirds of the automobile users of the country will lend their financial and moral support to bettering the general conditions of automobiling. If there isn't a local club in your vicinity, see that one is formed of at least a dozen members,

for that is the reasonable minimum required for the organization of a club which can become a part of and have a spokesman in the councils of your State association. If there isn't a club, you can join direct as an individual member.

Certainly the surest way to obtain automobile peace is to complete the organization of a widely scattered army of automobile users, necessarily democratic in character, and reaching wherever a motor-driven vehicle adds to the comfort and longevity of life.



EVOLUTION OF THE AUTOMOBILE CLUTCH.

Few better instances of the special requirements involved in the design of automobile parts could be cited than those given in connection with a review of the development of the automobile clutch, part of which appears in this week's issue of THE AUTOMOBILE. Conditions met with are so totally different that precedents are worse than valueless, though, as the writer of the article in question makes plain, there was little data available on clutch design even in the general engineering field, clutch makers having learned by experience what size clutch of their own make is necessary to transmit a given horsepower in machine shop practice. This was the state of affairs that confronted the automobile engineer at the outset, so that it is hardly to be wondered at that clutch troubles formed no small part of early defections.

Chief among the facts brought out by this highly interesting paper is that of the status of the cone type of clutch, which has held its own despite the numerous special types that have been introduced with a view to overcoming what have since proved to be not so much defects of design as lack of provision for the specially hard service to which the clutch is subjected. The discovery of the great value of cork as a friction material has also been instrumental in keeping this type in favor, and its use marks one of the greatest steps in advance where clutch efficiency is concerned.



PROBLEM OF DUSTLESS ROAD BUILDING.

Despite the numerous ideas advanced for the building of an improved type of road, nothing as yet seems to have succeeded in superseding MacAdam's plan. In fact, the problem has somewhat resolved itself into a question of road preservation, and many master minds are now devoting themselves to the subject. Macadam construction has proven itself a superior form for a great many purposes, barring its rather important lack of permanency. In other words, under increased traffic it is subject to more or less rapid disintegration, and it is this feature that road builders all over the world are trying to remedy. Of the various methods experimented with, none yet appears to have proven so effective as the application of hot coal gas tar, which is not merely a surface treatment, as the tar percolates through to the lower strata of the road construction, binding it in an efficient and more permanent manner than has heretofore been the case with similar applications of other materials. Up to the present, this appears to be one of the most successful methods adopted, and the further experimenting now being carried on at Hartford and Savannah should bring out further facts in its favor.

A. M. C. M. A. TALKS OF ITS OWN CHICAGO SHOW

THAT discussion of the idea of promoting an independent show in Chicago along the lines of its policy of holding exhibitions of its own, as in the case of the Grand Central Palace function in New York, occupied some of the attention at the meeting of the Committee of Management of the American Motor Car Manufacturers' Association, held at its New York headquarters on Tuesday, is evidenced by the show committee being empowered to make arrangements therefor. In its official announcement of the proceedings, the Association's publicity department states that in accordance with letters from Chicago, associated in the Western show will also be the Chicago Automobile Club and the Chicago Motor Club.

The question of program advertising was also discussed, with the result that it was voted that in view of the fact that this class of advertising is many times of questionable value, the use of such mediums should be discouraged.

The show committee reported on the arrangements for the Grand Central Palace show, to be held December 31 to January

7, in conjunction with the Importers' Automobile Salon and the Motor and Accessory Manufacturers, Inc. E. R. Hollander has been named to represent the importers on the show committee, and D. J. Post will serve the interests of the Motor and Accessory Manufacturers.

Upon the recommendation of the good roads committee, the association appropriated \$500 for the A. A. A. National Legislative and Good Roads Convention, to be held at Buffalo, July 8 and 9.

There was a full attendance of the Committee of Management, including Benjamin Briscoe, chairman (Maxwell-Briscoe Motor Co.), R. E. Olds (Reo Motor Car Co.), James Couzens (Ford Motor Co.), H. O. Smith (Premier Motor Mfg. Co.), G. V. Rogers (Mitchell Motor Car Co.), W. H. VanDervoort (Moline Automobile Co.), C. G. Stoddard (Dayton Motor Car Co.), S. H. Mora (Mora Motor Car Co.), Charles E. Lewis (Jackson Automobile Co.), Job Hedges, the association's counsel, and Alfred Reeves, general manager.

THE "SOLID SOUTH" WANTS CUP RACE.

NEW ORLEANS, LA., May 11.—The success of the Savannah stock-car races did much for the automobile trade in the South, which is now much interested in the selection of the course for the Vanderbilt Cup race. It is a "Solid South" for Savannah. Dealers in this city, as well as in all the other larger Southern cities, are of the opinion that the holding of this race below the Mason and Dixon line would be the best thing that could happen for the Southern interests.

A local dealer expresses the opinion that the Savannah race awakened more real interest in automobiles, and particularly in the good roads movement than anything else in recent times.

A movement has been started here, and which is about ready to carry into operation, for the building of an automobile road between New Orleans and Baton Rouge. This road is to follow the Mississippi, and when completed will, without doubt, be the best 100-mile road in this part of the country. Then, too, a road is now being built between this city and Chef Menteur on Lake Pontchartrain, which is 25 miles long. This road is built of shells, is white as snow, level and very fast.

Chef Menteur is right in the heart of the fishing and hunting sections. When the road to Baton Rouge is completed this will make one of the finest roads in the country, and about 125 miles long.

CHANGES IN N. A. A. M. REPRESENTATION.

At its regular monthly meeting held in New York City, May 6, the National Association of Automobile Manufacturers received the resignations of W. E. Metzger, as representative of the Cadillac Motor Car Company; V. M. Gunderson, as representative of the Northern Motor Car Company; H. E. Coffin, representing the E. R. Thomas Detroit Company, and E. R. Chapin, the E. R. Thomas Motor Company of Buffalo. Mr. Metzger was then re-elected to succeed Mr. Gunderson as representative of the Northern company, in which the former Cadillac general sales manager is known to have been considerably interested for some time, and Mr. Chapin was re-elected to fill the vacancy caused by Mr. Coffin's retirement. The Cadillac company and the E. R. Thomas Motor Company have not as yet nominated their new members.

WASHINGTON GETS TAXICAB HABIT.

WASHINGTON, D. C., May 9.—Motor taxicabs are making a big hit in Washington, and it is likely several companies will be operating them here before the end of the summer. The Federal Taxicab Co., of which E. R. Thomas is president, was the first to invade the field. Six Elmore taxicabs were placed in service here last week by the New Union Garage Company.

LAND OF EVANGELINE IS DECREED TO BE AUTOLESS

WOLFVILLE, N. S., May 11.—In order to appease a few irate and misguided agriculturists who look upon the automobile as the incarnation of evil, the Provincial Legislature, otherwise the House of Assembly and the Legislative Council, recently passed an amendment to the motor vehicle law. This makes it lawful for every city, town, or municipality in the Province of Nova Scotia to make regulations prohibiting the use and operation, on certain days of each week, of motor vehicles, upon any of the public highways, etc. So far Pictou county has been the first to take advantage of the law, and has prohibited the use of automobiles within its borders on every day except Monday.

As the direct result of this retrogression to the dark ages, the Nova Scotia Automobile Association has sprung into being, its chief object being the protection of its members against this form of tenth century legislation. The secretary of the new association is W. L. Kane, Halifax, N. S.,

and American tourists who have thoughts of including the "Land of Evangeline" in their itineraries for this summer would do well to consult Mr. Kane in advance before going to the expense of taking their cars to this now hostile country. The prohibitory movement is as yet in its infancy, Cumberland county being the only one that has followed the example of Pictou, though it has not gone to the same extreme, Monday, Thursday and Sunday being the black letter days in Cumberland. But others are quickly falling into line. The County Council of Kings has appointed a committee to confer with the Councils of Annapolis and Hants, to select prohibitory days, with a strong recommendation that only two days in the week be left open. It is currently reported that it is the desire of some of the councilors for each county and town to select different days, thus making the prohibition absolute for all practical purposes. As an example of restrictive legislation the above is about "the limit."

CELEBRATE FOURTH WITH ROAD RACE.

BOSTON, May 9.—To concentrate its Fourth of July celebration into an automobile road race is the idea which has been suggested to the people of Lowell. The scheme of a 200-mile road race on a 10-mile course to the north of the city was broached only a week or so ago, but since then events have been moving rapidly. An organization called the Lowell Automobile Club has been formed, with John O. Heinze, of the Heinze Electrical Company, as president; Frank S. Corlew, prominent in the New England automobile trade, as vice-president; John A. McKenna, secretary, and Harry Dunlap, as treasurer.

This club has applied for membership in the Massachusetts State Automobile Association of the A. A. A., and has also applied for a sanction for its race meeting. In addition, the club has been offered a costly trophy for the race, the donor being Congressman Butler Ames, grandson of General Benjamin Butler, and arrangements are being made to have the militia of Lowell, and, perhaps, of the neighboring city of Lawrence, turn out to do guard duty during the race, it being claimed that the services of the militia can be secured on the holiday without the usual order from the Governor. The roads that are to be used are to be improved where necessary, corners banked, and given a thorough oiling. A large grandstand is to be erected, and the Lowell club plans to invite prominent members of the A. A. A., experienced in road racing, to act as officials. Vice-President L. R. Speare, it is said, has already consented to officiate as referee.

NEW CUPS FOR GIANTS' DESPAIR CLIMB.

WILKES-BARRE, PA., May 5.—All obstacles to an A. A. A. sanction having been removed, the Wilkes-Barre Automobile Club is preparing to make its annual Decoration Day climb up Giant's Despair far bigger and more noteworthy than any former one of the series. John Willis Hollenback's offer of a cup costing from \$500 to \$1,000, to be competed for annually, has been accepted. A feature of the climb will be the patrolling of the course by the C. T. A. U. regiment, an independent military body which has volunteered. The program will embrace nine other events.

The following program has been arranged:

- Event 1.—Gasoline stock cars, \$850 or less.
- Event 2.—Gasoline stock cars, \$851 to \$1,250.
- Event 3.—Gasoline stock cars, \$1,251 to \$2,000.
- Event 4.—Gasoline stock cars, \$2,001 to \$3,000.
- Event 5.—Steam or gasoline stock cars, \$1,250 to \$3,000.
- Event 6.—Gasoline stock cars, \$3,001 to \$4,000.
- Event 7.—Four-cylinder stock cars, \$4,000 or over.
- Event 8.—Six-cylinder stock cars, \$2,500 or over.
- Event 9.—Free-for-all types and motive power.
- Event 10.—Gasoline stock chassis not exceeding 103.87 total piston area.

Event 11.—Steam cars.

Event 12.—Cars owned by Quaker City Motor Club members.

Event No. 10 is intended for Briarcliff models and will have a special cup for its prize.

BRIDGEPORT CLUB TO PROTECT CITIZENS.

BRIDGEPORT, CONN., May 12.—The Automobile Club of Bridgeport is to take summary action against the dangerous driving of reckless and incompetent chauffeurs. The subject was brought before the club by complaints against one or two chauffeurs on the occasion of the club run to the Briarcliff race. By resolution, a committee of public safety has been established, which will include a lawyer.

President Staples has appointed the following as the club's delegates to the Connecticut State Automobile Association, which will hold a meeting in Bridgeport, May 30: Frank Miller, F. W. Bolandé and Silas Burton. The board of governors has been increased to twelve members.

Robert M. Cranford, of New York, has presented the Cranford cup to take the place of the Gale cup, which he won at last year's hill-climb.

THE THOMAS CAR ARRIVES IN JAPAN.

According to a cable to the New York Times, the Thomas car and its American crew arrived at Yokohama on the *Shawmut*, May 10, after an 18-day passage, but, much to the disappointment of the American colony, the car was not disembarked. The foreigners had paraded through the town and received a great reception from their compatriots, and the Americans were eager to show them what their representative could do, but the Thomas, unfortunately, remained on the steamer, being unloaded at Kobe. From the latter place, Schuster will run it over the mountains to Tsuruga with the aid of a Japanese guide, and will take a steamer from there for Vladivostok, Friday, May 15.

The French committee in charge of the race held a meeting at Paris, May 7, in order to pass upon the questions arising from the change of route made necessary by the impassability of the Alaskan trail. It was decided that the Thomas car be allowed 15 days over its nearest competitor in the trip through Siberia owing to the advantage it lost by going to Alaska, while the committee further decided that the Protos be penalized 15 days for shipping from Ogden to Seattle, thus placing it 30 days behind the Thomas. The Russian committee is said to have made all preparations in the way of fuel and supplies along the route, so that everything is in readiness for the start when the American car reaches Vladivostok.

SILVER TROPHIES FOR LONG ISLANDERS.

BROOKLYN, N. Y., May 11.—In a letter to the members that fairly bristles with evidences of an active club life, Charles Jerome Edwards, president of the Long Island Automobile Club, calls their attention to the fact that the open season for automobilism has arrived, and to the several silver cups offered for club competition.

The membership cup, offered by Louis T. Weiss, will be awarded to the member securing the greatest number of recruits during the year ending December 31, 1908, while the attendance cup, offered by Leffert Lefferts, will be presented to the member attending the greatest number of club runs and contests during the same period. The mileage cup, presented by President Edwards, will go to the member whose odometer registers the greatest distance traveled during the touring season, beginning May 1 and ending November 1, the club manager, H. H. Creighton, keeping a record of the speedometers. Beside the foregoing, there is a touring cup, offered by Samuel H. Burns, for the member who tours in the greatest number of States or Provinces during the touring season ending November next.

The first club run of the season to the country clubhouse at Bay Shore, Long Island, is announced for May 17, while the contest committee announces a series of contests to be held June 5, on Hillside avenue, Jamaica, in connection with the Jamaica Citizens' Subway Celebration.

EVANS JOINS A. A. A. GOOD ROADS BOARD.

PHILADELPHIA, May 11.—Powell Evans, president of the Automobile Club of Philadelphia, has been made a member of the executive committee of the Good Roads Board of the American Automobile Association. President Evans is responsible for much of the recent activity of the Philadelphia club, which is accomplishing excellent work in Philadelphia and vicinity. Secretary S. Boyer Davis is also entitled to a good bit of the credit for recent results.

NEW YORK TO CELEBRATE ORPHANS' DAY.

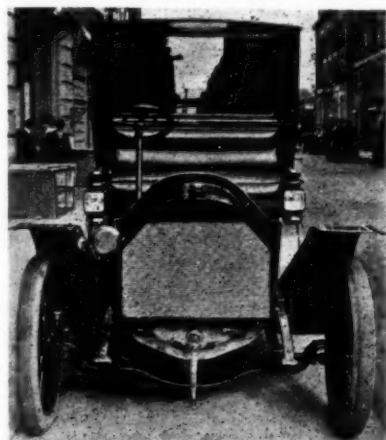
There is now small likelihood that the New York end of the Greater City's celebration of Orphans' Day will be allowed to go by default this year. The probabilities favor the New York Automobile Trade Association undertaking the promotion of the celebration as the outcome of a conference of its leaders and several charitable outside enthusiasts held yesterday.

AMERICAN LOCOMOTIVE MOTOR CAB.

By B. D. GRAY, CHIEF ENGINEER, Am. Loco. Auto. Co.

IN the motor cab produced by the American Locomotive Automobile Company, of which the first hundred are now being put into service by the Waldorf-Astoria hotel in New York, is found a new attitude toward the economic aspect of the tariff cab for city use. This attitude is the habitual one of this company which believes that building for long service is most economic in the end, even at a slightly greater initial cost.

Having decided to enter the field the American Locomotive Automobile Company made an exhaustive investigation of the various makes of cabs and the conditions under which they are operated, both here and abroad. The results of this indicate that the requirements of the service are exacting in such a way that a cheaply constructed vehicle is unlikely to be lucrative. It was found to be the experience of some companies that while the gross receipts were ample, the net



"Bow View" American Berliet Cab.

profit was nil, owing to the vehicles being in commission only about 50 per cent. of the time, and that to be finally profitable such vehicles should be so constructed that they can be kept in commission about 85 per cent. of the time. It is not practicable to exceed this figure, owing to the periodical necessity of repainting and overhauling, and the occasional repairs necessary to the best of power plants.

Engaging in the manufacture of cabs the American Locomotive Automobile Company, for the reasons cited, undertook to produce a vehicle in which the resistance to wear was the prime consideration and the expense of material and construction secondary. Generally speaking, the motor cab is built on the same lines and of the same material, and with the same exacting methods as the Locomotive Company's touring car, which occupies its own distinctive pedestal, the chief feature of difference being in the final transmission of power from the gear case to the rear wheels, which, in the case of the cab, is not by chains, but by a shaft drive. Imported materials are used in such important parts as cylinders, crankshaft, springs, frames, etc. The general specifications of the cab are as follows: Wheelbase, 103 inches; tread, 55 inches; height of frame from ground, 24 inches; weight of cab complete, 2,600 pounds; tires, 32 by 4 inches all around; available body space from dash to rear of frame, 98 inches; width of frame, 34 inches.

The motor is of the four-cylinder vertical type, placed forward of the dash under the usual form of bonnet, bore and stroke, being 3 15-16 inches by 4 3-4 inches; nominal rating, 16-horsepower at 800 r.p.m. Multiple disc clutch is used of the same type as is used in the Berliet cars. The ignition is low tension, make-and-break, with Simms-Bosch magneto. No spark advance is provided, this having been predetermined with the idea of precluding the possibility of an inexperienced driver abusing the motor. In further carrying out

this idea, a governor control is provided, whereby the maximum speed of the motor is limited to 800 r.p.m. This control is extremely sensitive and absolutely reliable.

The lubrication of the motor is effected entirely by splash, oil being fed to the crankcase by means of gravity through a sight feed oiler. As a guarantee against excess of oil and consequent smoky exhaust, hollow plugs are provided in the bottom of the crankcase to maintain a constant oil level, any excess being carried off to an overflow tank through these plugs. Cooling is effected by an extremely efficient honeycomb radiator, the water being circulated by a centrifugal type of pump, which has ample capacity to cool under most trying conditions.

The transmission is of the selective sliding gear type, providing three speeds and reverse, the high gear being direct. The reduction on the high gear is 3.8 to 1, giving a vehicle speed of 20 miles an hour with the maximum motor speed indicated.

The rear axle is, perhaps, the most novel feature of the cab, because of its being a peculiar design, distinctive to the American Locomotive Automobile Company. The axle proper, or the load supporting member, is composed of a one-piece drop forging, consisting of a large central ring and terminating in a tubular section at each end, and the tubular section being ribbed, top and bottom, to the central ring. This forging is so designed as to give as nearly as possible a theoretically correct distribution of metal to perform its several functions. The spring seat and brake anchor are integral and fitted rotatively on this forging, therefore transmitting the braking torque through springs to the frame. Special attention has been given to the location of spring suspension, as that feature makes so much for the comfort of the passengers as well as for the life of the motor.

Hess-Bright (D. W. F.) bearings are used throughout the transmission, rear axle and in the front wheels. Interchangeability has been made a very important factor in the construction, by virtue of which it is possible to replace any of the important elements, such as front or rear axle, transmission, motor, steering gear, etc., from stock, without having to specially fit or line up the part. Accessibility is another important feature, it being possible to examine practically the working parts individually without disturbing other adjacent parts. For example, the clutch or gear-set may be removed as a unit, and the same is true of the motor and rear axle.

Besides seeking to produce a cab to stand the racking of traffic service in the city, it has been the aim to provide a vehicle which shall have the luxurious riding qualities of a private car, and further to equip the chassis with a body as substantial and elegant as for high-class individual work.



Attractively Substantial Lines of the American Locomotive Auto Company's Cab.



Standard Flandrau Landaulet on Packard Chassis.

NEW YORK CITY A BODY BUILDING CENTER.

Few outside of those directly engaged in the automobile trade realize what a center New York City has become for the high class body builders. It held that post of honor long before the automobile came upon the scene, the numerous carriage manufacturing houses who have been in business here for more than half a century having become specialists in the art of body building for the automobile, and it has been extended even beyond what has been customary in the fitting up of the finest carriages. One of the most prominent of the houses in question is Flandrau & Company, 406-412 Broome street, New York, and a typical sample of their work is shown on a Packard chassis by the accompanying photograph. It is the standard landaulet body made by this firm and is designed to seat five passengers inside and one beside the driver, although it can be made to carry six inside if desired. The color scheme in this case was green, the panels being painted in a special shade ground by the makers for this order, while the inside is trimmed with leather made especially to match the color of the paint. The interior fittings, such as the dome light, card cases, foot rest, speaking tube and the like are all of exclusive patterns, the whole design producing a most striking effect in conservative colors.

PIERCE ARROW FOR ST. PAUL FIRE FIGHTERS.

Through their St. Paul agent, the George N. Pierce Company, Buffalo, N. Y., have just supplied the fire department of that city with a car specially built to aid the fire fighters. The car is one of the 45-horsepower, four-cylinder type of the Great Arrow product, its lines being illustrated by the accompanying photograph. The body has been built specially for the purpose, having a disappearing rear seat. The under portion of the body is arranged to accommodate boots, helmets and the other paraphernalia of the fire chief, for whose use the car has been specially provided. The official in question realized some time ago that the usual horse and buggy were not adequate to the requirements and the order for the Pierce resulted.



St. Paul's Fire Chief in His New Pierce Great Arrow.

OIL REFINERS INSTITUTE LITIGATION.

PHILADELPHIA, May 11.—As the result of the wholesale pirating of trade-marked brands of lubricating oils that has been carried on during the past half year, eight separate actions to recover an aggregate amount of \$35,000 as damages, have been filed in the Common Pleas court by J. R. Wilson, representing Charles F. Kellom, a pioneer American refiner of lubricants. Other actions will follow shortly, it being the plan of the plaintiffs to bring suit against all dealers and users, such as supply stores and garages, who have been handling an alleged spurious imitation of the Kellom brand of "Invader" oil. Serious charges of fraud and deception are made against the defendants in a number of the suits, the imitations having been purchased by agents of the plaintiffs in numerous cases in which the dealer guaranteed the oil to be the genuine Invader brand, while the chemist's analysis showed it to be quite the contrary.

Practically all the defendants in the first eight actions, are garages. It is commonly reported that several other well-known refiners of lubricating oils find themselves in a similar position where their brands are concerned, small dealers all over the country selling inferior products under their name, refilling their trade-marked cans with cheap oils, and the like.

RUSHMORE OBTAINS FURTHER INJUNCTION.

NEW YORK, May 11.—Following up its policy of obtaining injunctions against lamp manufacturers who are alleged to have been turning out colorable imitations of its designs, the Rushmore Dynamo Works, Plainfield, N. J., recently obtained a favorable decision against the Badger Brass Manufacturing Company, by Judge Lacombe, sitting in the United States Circuit Court for the Southern District of New York. The decision takes the form of an injunction forbidding the defendants to make or sell lamps in colorable imitation of the Rushmore flare front design. The decision is one of a number resulting from litigation instituted in November, 1907, and which has resulted favorably throughout for the complainants. It is especially worthy of note, as the question, at no time, has been one of patents, but of unfair competition, the doctrine involved being that of illegality of competition by means of imitations—something of long standing in England, but one that has not been recognized to any great extent in this country up to within very recently.

LELAND HAD A MINIMUM OF TIRE TROUBLE.

In the course of the story of the Briarcliff race which appeared in THE AUTOMOBILE, it is stated that Leland, one of the Stearns drivers, was delayed to a considerable extent by punctures and other damage to his Pennsylvania tires. When this was called to Leland's attention by the manufacturers, the Pennsylvania Rubber Company, Jeannette, Pa., he stated that his Pennsylvania tires supplied the best performance that he had in his racing experience, having been adopted after previous testing of various tires for this purpose, the dismountable rims the car was equipped with having been responsible for the delay.

In addition to Leland's statement, F. B. Stearns said that the Pennsylvania tires used in the trials and during the race showed up so well that he was enthusiastic over them. "I have used several sets of these tires beside those used on the racing car and they have been very satisfactory," added Mr. Stearns, "and I am also recommending my friends to use Pennsylvania tires."

NEWARK MAY HAVE AN AUTO FACTORY.

NEWARK, N. J., May 11.—A rumor is current here to the effect that an automobile manufacturing plant is to be established here within the next few months. A two-cycle gasoline car, on which patents are said to be held by a local mechanic, will be built, the first model, which will be a 30-horsepower runabout, being turned out on a small scale. A. H. Newton is said to be back of the concern which is now being organized.

PENNSYLVANIA ENTRANT FOR VANDERBILT.

BRYN MAWR, PA., May 11.—As the result of the continually increasing demand for a very fast semi-racing type of car, the Auto Motor Company, builders of the Pennsylvania cars, have decided to bring out a stock car to be known as the "Vanderbilt" model, and it is also the intention of the makers to enter one of these cars in the Vanderbilt race next fall. The power plant will consist of the valve-in-the-head type of motor that is a distinguishing feature of the Pennsylvania car, its dimensions being 41-4 by 41-4 inches; it will also have the same type of unit axle and transmission. The wheelbase will be 105 inches, and the car will be guaranteed to develop 75 miles an hour.

In addition to the foregoing, this firm is also bringing out a new "Pennsylvania 25," officially known as Type D, which will be a five-passenger touring car or roadster, embodying the same features of construction as the Vanderbilt model referred to, and designed to sell at \$2,250. The first of this model will be on the road in about six weeks and, as a number of orders are already booked for them, shipments will begin about August. The company is now planning a 125 by 281-foot, two-story addition to its plant, which will be devoted to the manufacture of a four-cylinder two-passenger roadster car to sell at \$1,200.

INDIANANS WILL HAVE SEALED BONNET.

INDIANAPOLIS, IND., May 11.—All arrangements have been completed for the sealed bonnet contest to be held under the auspices of the Indianapolis Automobile Trade Association on May 20. However, it has been decided not to divulge the route or conditions until about two days before the contest. George Weidley, of the Premier Motor Manufacturing Company, is chairman of the committee having the event in charge.

HOW OVERLAND CARS ARE COMING THROUGH.

INDIANAPOLIS, IND., May 4.—Since the Overland Automobile Company, of this city, was reorganized last fall, J. N. Willys, of the American Motor Car Sales Company, becoming president; W. H. Brown, of the Pope-Waverly Company, vice-president, and P. D. Stubbs, of the Knox Automobile Company, secretary and treasurer, it has progressed very rapidly, producing more than double the number of cars since March 1 of this year than it did in all its five years' previous existence. The accompanying photograph of the assembling department of the Overland plant serves to give some idea of the rapidity with which the Overlands are now being put through the works, five complete cars being turned out each day. The demand for the Overland has grown so that the company is now considerably behind its orders.

FINAL STANDING HARRISBURG CONTESTANTS.

HARRISBURG, PA., May 11.—At the conclusion of the painstaking and exhaustive examination of the technical committee, it was generally conceded that the endurance run of the Automobile Club of Harrisburg had been conducted in a most thorough and sportsmanlike manner, the sole discordant note being the protest of the Rambler entrant, No. 25, driven by A. H. Bitner, which was penalized 17 points for loose hand brakes, W. F. Smith, the Philadelphia agent of the Rambler, claiming that the penalty was excessive, although Rule 24 bound all entrants to accept the technical committee's findings as absolute. The White in Class A, driven by Walter White, and C. C. Cumber's Pullman in Class D, were the only all-round clean scorers, each winning two cups.

The appended table shows the penalties imposed in all four classes for both road faults and technical defects:

No.	Car	Driver	Road Penalties	Technical Penalties	Total
CLASS A					
28	White	Walter White	0	0	0
16	Thomas	C. C. Fairman	0	15	15
5	Pullman	Robert Morton	65	0	65
7	Pullman	J. A. Kilne	61	60	121
10	Stoddard-Dayton	Robt. Shlrk	189	0	189
18	Pierce-Arrow	Arthur Kumpf	0	..	Out
CLASS B					
22	Mitchell	W. M. Cram	0	2	2
19	Maxwell	Chas. Fleming	2	4	6
21	Maxwell	A. Bender	6	19	25
6	Pullman	M. Graupner	30	21	51
23	Cadillac	C. C. Crispen	4	76	80
3	Jackson	Chester Smith	15	..	Out
15	Elmore	A. D. Miller	51	..	Out
CLASS C					
8	Pullman	Stuart Lafean	0	6	6
27	Pennsylvania	L. Fuegel	0	11	11
25	Rambler	A. H. Bitner	0	17	17
17	Apperson	C. J. Swain	13	5	18
4	Pullman	E. G. Irvin	9	56	65
11	Stoddard-Dayton	H. Hodson	0	..	Out
CLASS D					
12	Pullman	C. C. Cumber	0	0	0
14	Atlas	F. K. Mears	141	15	156
20	Maxwell	J. E. Sellers	146	66	212
24	Ford	A. A. Jones	350	96	446
9	Pullman	C. C. Cocklin	450	29	479
2	Jackson	H. G. Zimmerman	0	..	Out
1	Cadillac	R. H. Hagerling	0	..	Out

Quakerites Also Now Travel in Taxicabs.

PHILADELPHIA, May 11.—Last week witnessed the first indication here of the taxicab fever which is now sweeping over the country. Ten of the Thomas variety arrived in the city, and although they have not yet been put at work, the close of the present week will see them in operation from one of the big hotels. The remaining forty vehicles of the first installment will probably be delivered before the close of the month, which number will be sufficient to make a start.



Capacious Assembly Room of the Factory of the Overland Automobile Company, at Indianapolis.

BRIEF ITEMS OF NEWS AND TRADE MISCELLANY

Dallas, Tex., has opened an automobile school which will be the largest, and, in fact, the only school of that character in the Southwest. J. W. B. Jeffords is president and manager, and W. A. Fosdick, vice-president and treasurer.

The Fairweather Club is to banquet the New York Carnival Committee on June 3. The report of the committee, by the way, will be presented at another dinner, to be given at the Hotel Brevoort on Saturday evening, at which the newspaper men are to be guests of honor.

Although the touring season is hardly under way as yet, the makers of the Elmore two-cycle cars have been agreeably surprised to find that their guarantee of 2,000 miles on one set of dry cells with the Atwater-Kent ignition system now installed on the Elmore, is being greatly exceeded in every case.

The Lockport Rubber Company, Lockport, N. Y., is a new concern organized to manufacture pneumatic tires, inner tubes and sundries in addition to complete lines of rubber goods for other purposes. The officers are Charles F. Kelly, president; J. Edwin Davis, vice-president; H. M. Wood, secretary. The concern is capitalized at \$300,000.

American products have long been making inroads into European commerce, but one of the first cases on record where a foreign war department has gone abroad for part of its equipment is to be seen in the case of the Dutch army, which has decided to equip its entire motorcycle corps with Solar headlights, which is a gratifying victory for the Badger Brass Manufacturing Company, Kenosha, Wis.

One of the buildings of the new plant of the Speedwell Motor Car Company, at Dayton, O., is now about ready for occupancy, while two more of the same size, measuring 30 by 150 feet, are now in course of construction. The working force now numbers about 75 men and orders are being received in such numbers that it has been found necessary to ship the cars by express in order to meet the demand.

The Gearless Motor Car Company, Rochester, N. Y., makers of the Gearless cars, has just been reorganized with the following incorporators: William Bausch, vice-president of the Bausch & Lomb Company; George F. Roth, collector of customs at Rochester; W. H. Rogers, president of the Rochester Tile & Brick Company; John W. Breyfogle, vice-president and treasurer of the Gearless Transmission Company, and John J. McInerney, attorney. The new company will be under the same management as at present and will continue the same plant and offices.

As the result of the various city ordinances in different parts of the country, excluding cars carrying non-skid chains and similar devices from park roads, the Republic Rubber Company has brought out a new tire equipped with what is known as the "Staggard Tread." This consists of five large ribs, which are cut transversely at intervals of an inch so that studs are left about the shape and size of a lozenge, this style of corrugation having the advantage of not working off or pulling loose. As it is entirely of rubber, there is no hardening of the tread of the tire and consequently no loss of resiliency.

A rumor has been current to the effect that John H. Patterson, president of the National Cash Register Company, has been negotiating with Alexander Winton, for the sale of the Cleveland factories of the company, of which Mr. Winton is the head, and that the cash register concern was about to embark in the manufacture of automobiles. Mr. Winton declares the rumor to be without foundation, and Charles B. Shanks, sales manager of the company, says: "I don't think Mr. Patterson, or anybody else, can buy the Winton company. We have been successful in the automobile business since its inception, and the outlook is that we will continue to be a strong factor in the trade."

TRADE CHANGES OF LOCATION.

The Chicago agency of the E. R. Thomas Detroit Company has been removed from the salesrooms of C. A. Coey & Company, on Michigan avenue, to Levy & Fanning, 390-392 Wabash avenue. George W. Hipple, who has been making a marked success in handling the Thomas-Detroit line, will be continued as branch manager. Mr. Hipple has been in charge of the Thomas-Detroit business in Chicago since it was established there last February.

The Swinehart Clincher Tire & Rubber Company's New York office will remove to 875 Seventh avenue June 1. The company has leased a three-story building at the above address and it will be devoted entirely to housing the Swinehart tire interests in New York. A similar building has been leased at 1720 Michigan avenue, Chicago, for the use of that branch and will be occupied July 1. It has been found necessary to secure larger quarters for both branches, owing to the fact that the work could not be handled at the old locations.

NEW AGENCIES ESTABLISHED.

The Percy Ford Company has succeeded Leon Rubay Company, at 226 Columbus avenue, Boston, and will do a general automobile supply business.

The S. & M. Supply Company is a new concern in the accessory field that has just opened business at 177 Portland street, Boston. A complete line of supplies and accessories of all kinds will be handled.

Bernard F. Goss has been appointed agent for the Atlas Motor Car Company, of Springfield, Mass., at Hartford, Conn., and will handle the Atlas line in that territory. He has established headquarters at 1124 Main street.

With a line already the largest in the city, the Bergdoll Motor Car Company, Philadelphia agents for the Benz, Berliet, Welch, Imperial and Reliance trucks, last week took on two additional agencies, the Rauch & Lang electrics and the Oakland.

C. F. Splitdorf, the well-known manufacturer of ignition specialties, has just opened a branch in Chicago. It is established in a well-appointed and commodious quarters at 310 Michigan avenue and a full line of the Splitdorf products will be constantly carried in stock for quick delivery. B. P. Houlihan, who for some years has been manager of this firm's branch in San Francisco, and who is well known to the trade throughout the country, will have charge of the new branch.

The interests of the H. W. Johns Manville Company in Detroit and adjacent territory, having increased to an extent where the business can no longer be properly attended to otherwise, a new branch house will be established there. It will be located at 72 Jefferson street, and will be under the management of Willard K. Bush, who has been connected with the Milwaukee branch of the same house for a number of years. Complete stocks will be carried at the new Detroit branch.

An important change in the agency forces along Broadway took place last week in the placing of the Acme line with the new firm of Cordner & Flinn, which has established headquarters at the northeast corner of Seventy-sixth street and Broadway. The concern is a recently-formed partnership between A. B. Cordner, long and favorably known in the life insurance field, and Welton H. Flinn, who has been representing the makers of the Acme in New York for some months past. The agency was formerly with J. B. Brewster & Company.

PERSONAL TRADE MENTION.

R. B. Mann, until recently connected with the White branch in Orange, N. J., has been added to the sales force of the Philadelphia branch of the White Company.

The Hamilton Auto Company, Philadelphia, agents for the Stoddard-Davton, last week secured the services of R. Y. Spare, formerly connected with the sales department of the Thomas agency there.

C. F. Green has acquired the auto top factory of the Automobile Equipment Company, and has severed his connection with that concern, combining his interests with the Motor Specialty Company, 239 Jefferson avenue, Detroit, Mich.

F. M. Germane, formerly located in Chicago, as western representative of the Standard Roller Bearing Company, has just been appointed sales manager of that concern, with headquarters at the factory in Philadelphia, where he has been located for the past 18 months.

Charles F. Barrett, formerly assistant engineer of the Electric Vehicle Company, Hartford, Conn., has joined the selling forces of the Locomobile Company, Bridgeport, Conn., and for a time, at least, will devote his energies to handling the product of that company in Hartford. Mr. Barrett finished the 1906 Glidden tour with a perfect score in a 24-horsepower Columbia, and won the class event in the Crawford Notch hill-climb.

Ernest H. Brandt, who has been identified with the Corbin Motor Vehicle Corporation, New Britain, Conn., for some time, as sales manager, has just been appointed general eastern manager for the Cadillac Motor Car Company. Eastern in this connection means New York, New England and New Jersey, as well as the cities of Philadelphia, Baltimore and Washington. Headquarters will naturally be in New York City, and it is understood that the salesrooms will be located in the vicinity of the Circle, at Fifty-ninth street. Previous to his connection with the Corbin interests, Mr. Brandt was with the Hartford Rubber Works Company and was associated with E. R. Benson, the new general sales manager of the Cadillac company.

INFORMATION FOR AUTO USERS

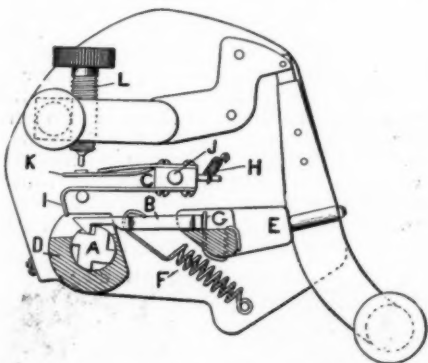
Hagstrom Blow Out Patch.—This is a device especially designed for the road repairing of rim cuts and blow outs, that is being placed on the market by the Hagstrom Brothers Manufacturing Company, Lindsburg, Kan. It is in the form of a sleeve and when applied to a tire that has been worn past the danger point, will effectively prevent a blow out. It is made of five layers of high-grade friction fabric and covered with a good quality of rubber, made amply strong to protect a blow out, or rim cut, several inches long. It takes



HOW THE HAGSTROM PATCH IS APPLIED.

the strain off the casing and prevents the tire from bulging out of shape, so that ordinary rim cuts and blow outs can scarcely be noticed, when repaired with the aid of the Hagstrom blow out patch. The patent metal clips are formed longitudinally to correspond with the radius of the shoe, with a tongue bend round the bead of the shoe, making the patch a permanent fixture, thus saving the inner tube when the shoe gives out. They are made to fit all sizes of shoes, and for the clincher, Dunlap and Fisk styles, as well as for all detachable rims. While giving protection to the inner tube, the patch itself is protected by the shoe and may be used any number of times.

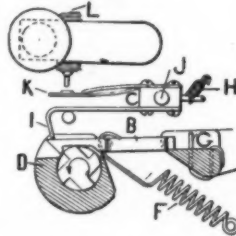
Atwater Kent Spark Generator.—The success with which this piece of ignition apparatus has met, particularly in connection with dry cells and other forms of battery, is due to the instantaneous and positive primary contact. The mechanism by which this is accomplished is extremely simple and ingenious, and very positive in



PLAN VIEW, ATWATER KENT CONTACT MAKER.

action. The illustration shows a plan view of this contact maker, the moving parts being the shaft *A*, the snapper *B*, and the pivoted contact arm *C*. The shaft carries four, or for a six-cylinder engine, six milled notches, forming a ratchet which engages the claw at the end of the snapper. The latter is a light piece of tempered steel, which is guided by slots in the bronze base *DE*, and is pulled by the spring *F* against a spring wire stop *G*, when released from engagement with the notches on the

shaft. The contact arm *C*, is likewise held normally in the position shown, by the tension of the spring *H*. The shaft, turning counter clockwise, draws the snapper into position, and the claw of the snapper, when released, rides up on the rounded part of the shaft, acting thereby as a wedge between it, and the steel hook *I*, of the contact arm, which is pivoted at *J*. The contact arm is thus oscillated to produce contact between a platinum point in the flat copper spring *K*, and the stationary insulated contact screw *L*. A special feature of the peculiar form of contact maker described is the fact that backward rotation produces no spark at all, which is an advantage in connection with a two-cycle motor, to prevent its reversing. The Atwater Kent Spark Generator is made by the Atwater Kent Manufacturing Works, 46 North Sixth street, Philadelphia, Pa.



DETAILS, ATWATER KENT CONTACT MAKER.

Electric Tail Light.—This is a novel electric lamp designed to aid the autoist in carrying out those provisions of the laws to be found in most of the States, which provide that the rear number be illuminated at night. That the average tail lamp falls far short of complying with this requirement may be seen at a glance at the ma-



ELECTRIC TAIL LIGHT FROM BOSTON.

jority of cars. This newcomer is manufactured by Holt & Beebe, 40 Sudbury street, Boston, Mass., and is designed to be attached either to the number plate, or to the body of the car. It is intended to be supplied with the necessary current from the sparking battery of the car. The light is thrown directly on the number and has the great advantage of not being shaken or blown out.

Decarbonizer.—To meet the constantly growing demand for some substance which would remove carbon desposits from the combustion chambers of a motor without the necessity of dismantling it, the General Accumulator & Battery Company, Milwaukee, Wis., has placed a compound known as "Decarbonizer" on the market. It is an oily substance mixed with chemicals that will combine with the carbon, and with the aid of the combustion in the cylinder, which volatilizes it, carries the carbon out

through the exhaust, leaving the piston, rings and cylinder perfectly clean and in a well-lubricated condition. The engine should be hot before using the Decarbonizer, and the oil should be shut off three to five minutes before injecting it, in order that the carbon deposits may be dry and the Decarbonizer soak into them. Two to three ounces should be put in each cylinder and the engine run until excessive smoking ceases. The exhaust valve must be closed when injecting the Decarbonizer or it will be forced out when turning the engine over to start. It will continue to act for hours after, or as long as there is any carbon in the cylinder. The makers guarantee it to be absolutely harmless when used in connection with gas and gasoline engines, also that a thorough cleaning of the working parts can be affected in 15 minutes.

Ackerman Parting Windshield.—This is a new type of windshield manufactured by Joseph N. Smith & Company, Fourth and Porter streets, Detroit, Mich., and which has numerous advantages over the ordinary style. It is designed to be operated from the seat of the car and may be raised or lowered in five seconds, locking securely in either position, and without any possibility of rattling. The top sash is hinged by the upper braces, preventing any



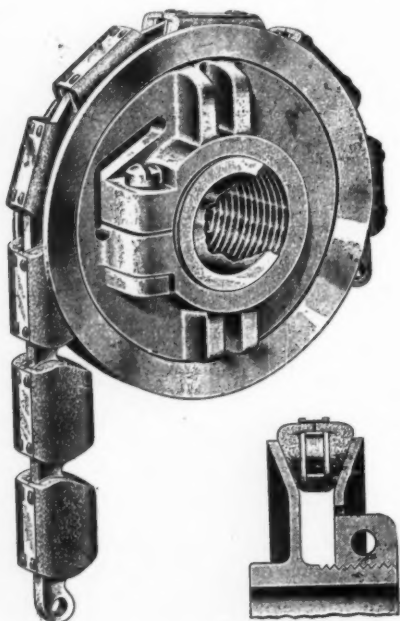
LINES OF THE ACKERMAN WINDSHIELD.

possibility of being detached, or dropping accidentally. It requires but four inches space to operate in and will thus avoid the lamps or steering wheel on any car. The braces are constructed with universal joints and are arranged so that they can be cut to any desired length. There are no projecting arms or handles to mar the beauty of the shield, while the bottom sash is made five inches wide, so as to allow for cutting to fit the shape of the dash without the use of any filler board. This construction reduces the possibility of accident to a minimum as no metal comes in contact with the glass, the channels across the center being padded to receive it. It is made regularly in 42 and 45-inch widths, special brackets being supplied according to whether the shield is desired for wood or metal dash. The same makers also manufacture coat and foot rails.

"Fillem" Tire Repair.—This is a substance designed to repair cuts, punctures, curb injuries, sand blisters and the like, to pneumatic tires, and is being placed on the market by the Greenwald Rubber Company, 31 Church street, Buffalo, N. Y. Neglecting these injuries to a tire allows water and sand to work through the plies and eventually causes the tread to separate from the fabric, thus ruining the tire. It would mean considerable expense and time to remove a tire to have it vulcanized every time it suffered damage of this kind, and the average autoist simply lets it go, thus

making the time when the tire needs re-treading, far shorter than it would be if this damage were tended to in time. To use, it is only necessary to remove all foreign matter from the cut, cleaning it out well with gasoline with the aid of a piece of muslin and a pair of tweezers. A piece of "Fillem" of the required size is then forced into the opening and the repair trimmed smooth with the wet blade of a knife.

Whitney Chain Belt.—This is a special type of belt designed to be employed in connection with cooling fans, oilers, for driving motorcycles and also for many purposes in connection with machinery where a high speed round small pulleys is required to be noiseless and positive. As will be apparent from the illustration, the chain is composed of center blocks, rivets and special side links, while a piece of leather of special shape is wrapped round each pair of side links and is held firmly in place by means of a steel plate on the top surface of the leather, the plate being held



DETAILS OF THE WHITNEY CHAIN BELT.

by projections on the side plates of the chain, which pass through the locking plate and are headed over against it. The locking plate has teeth on each side which are imbedded in the leather in order to hold the ends securely together. Nothing but the leather comes in contact with the grooved pulleys, but the chain center makes the belt absolutely flexible, even when running round a pulley of small diameter, and it prevents the belt from stretching. By means of the adjustable pulley, the chain belt may be stretched to the exact tension required without the use of an idler, and also without an adjustment between the centers of the pulleys. The flanges of the adjustable pulley are brought together to tighten the chain and when they are separated, the chain will loosen. An absolutely noiseless and positive drive is insured. Several prominent automobile builders are now trying out the Whitney chain belt on their cars with excellent results.

Slama Tire Protector.—This is a new type of steel tire protector and non-skid device that is being manufactured and marketed by the Slama Tire Protector Company, 609 East Fifteenth street, Kansas

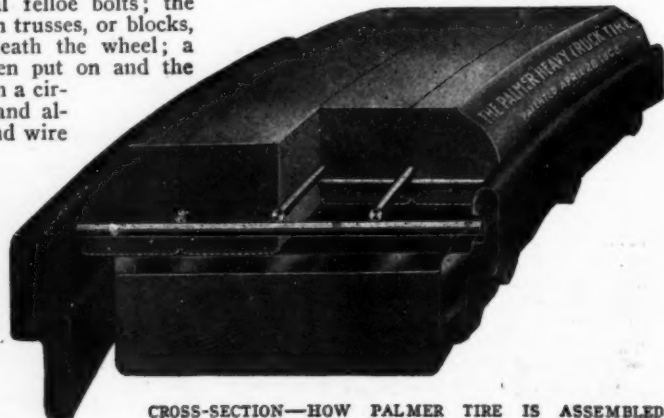
City, Mo. It is made of steel links of special formation, as will be seen by the accompanying illustration showing it in place on a tire, and is complete in one piece, the fastening consisting of a single hook. It is primarily intended for continuous service, only the broad, smooth backs of the



SLAMA TIRE PROTECTOR IN PLACE.

crosses, or links, coming in contact with the rubber of the tread, but it is easily attached or removed and can be rolled into comparatively small compass to stow in the tool box. It is adjustable to fit all makes and sizes of tires.

Palmer Heavy Truck Tire.—This is the invention of H. A. Palmer, Akron, O., who has had a number of years' experience in the manufacture of both solid and pneumatic tires, and is designed to do away with the disadvantages at present existing in the one piece type of solid tire for commercial vehicle use. The new Palmer tire is made in annular sections with transverse holes molded near the base, and in which the cross rods are inserted when the tire is applied. This is shown by the sectional illustration. Between each rubber section, and over, or above, the cross rods, is a circumferential wire ring. On each surface of the side flanges, recesses are provided to engage the cross rods in order to prevent creeping, the circumferential rings, holding the tire in place and preventing any outward movement. While in use under heavy loads, the cross rods move slightly with the rubber, both to and from the wheel base, as well as circumferentially, which prevents the rubber wearing away from the cross rods. To apply the tire, one flange is placed on the wheel and held in position with several felloe bolts; the wheel is then laid flat on trusses, or blocks, with the flange underneath the wheel; a section of rubber is then put on and the cross rods inserted, then a circumferential wire ring and alternate rubber section and wire ring, until the proper width is obtained. The other flange is then placed in position and bolted securely. Should a section or part section become damaged, it may readily be replaced by removing one of the side flanges, the operation being very simple and easy.



CROSS-SECTION—HOW PALMER TIRE IS ASSEMBLED.

Acme Roadster.—This is one of the latest additions to the constantly increasing number of buggy type cars being turned out in the West. It is the product of the Motor Buggy Manufacturing Company, 309 South Third street, Minneapolis, Minn. The power plant consists of a two-cylinder vertical, water-cooled four-cycle motor, of 4 1-2-inch bore by 4-inch stroke, rated at 16 horsepower. Jump spark ignition using batteries is employed, while an option of the Schebler or Heitger carbureters is offered. The radiator is built of brass tubes surrounded with copper fins. The change speed gear is of the planetary type giving two forward speeds and reverse, while the drive is by means of double chains, Hyatt roller-bearings being used on the counter shaft and transmission, while Timken roller-bearings are used on the wheels. The frame is made of 1-4 by 1 3-4-inch angle steel and the body of white wood on oak sills. Speeds of from one to 25 miles an hour are possible as the car only weighs 1,300 pounds. The wheelbase is 86 inches and the tread standard.

The advent of the new Acme Roadster marks a return to the two-cylinder vertical type of four-cycle motor that has been so largely used abroad, but which has come in for comparatively slight attention at the hands of American makers.

Ze-nole.—This is an up-to-date cleaner for auto tops and slip linings, that is manufactured and marketed by F. S. Carr, 74 Pearl street, Boston, Mass. It will remove all spots caused by dust, rain or mud, as well as grease spots, and keeps a top in good shape merely with a few minutes regular attention. It can be freely used, as it has no injurious effect on the rubber compound. Mr. Carr is also an importer of auto top materials and handles a line of domestic fabrics for this purpose in addition. Experience has taught that mackintosh material is the most artistic and most practical cloth for this purpose, being made in a wide variety of shades to harmonize with the finish of the car. Complete lines of samples of both foreign and domestic materials will be sent to makers or owners by Mr. Carr on request.

Miller & Starr Grease Gun.—In the description of the "quick acting" grease gun which recently appeared in these columns, the makers, Miller & Starr, call attention to the fact that it was erroneously stated that the gun is filled by removing the cap, whereas it should have been said that this was done by unscrewing the nozzle from the barrel. The barrel should then be pushed into the grease gradually, turning the handle from right to left. The makers further state that it would be impossible to unscrew the cap as directed, without breaking the lugs in it, thus damaging the gun.